1141

P-12/F4B in action

Aircraft Number 141

squadron/signal publications

P-12/F4B in action

By Larry Davis
Color By Don Greer
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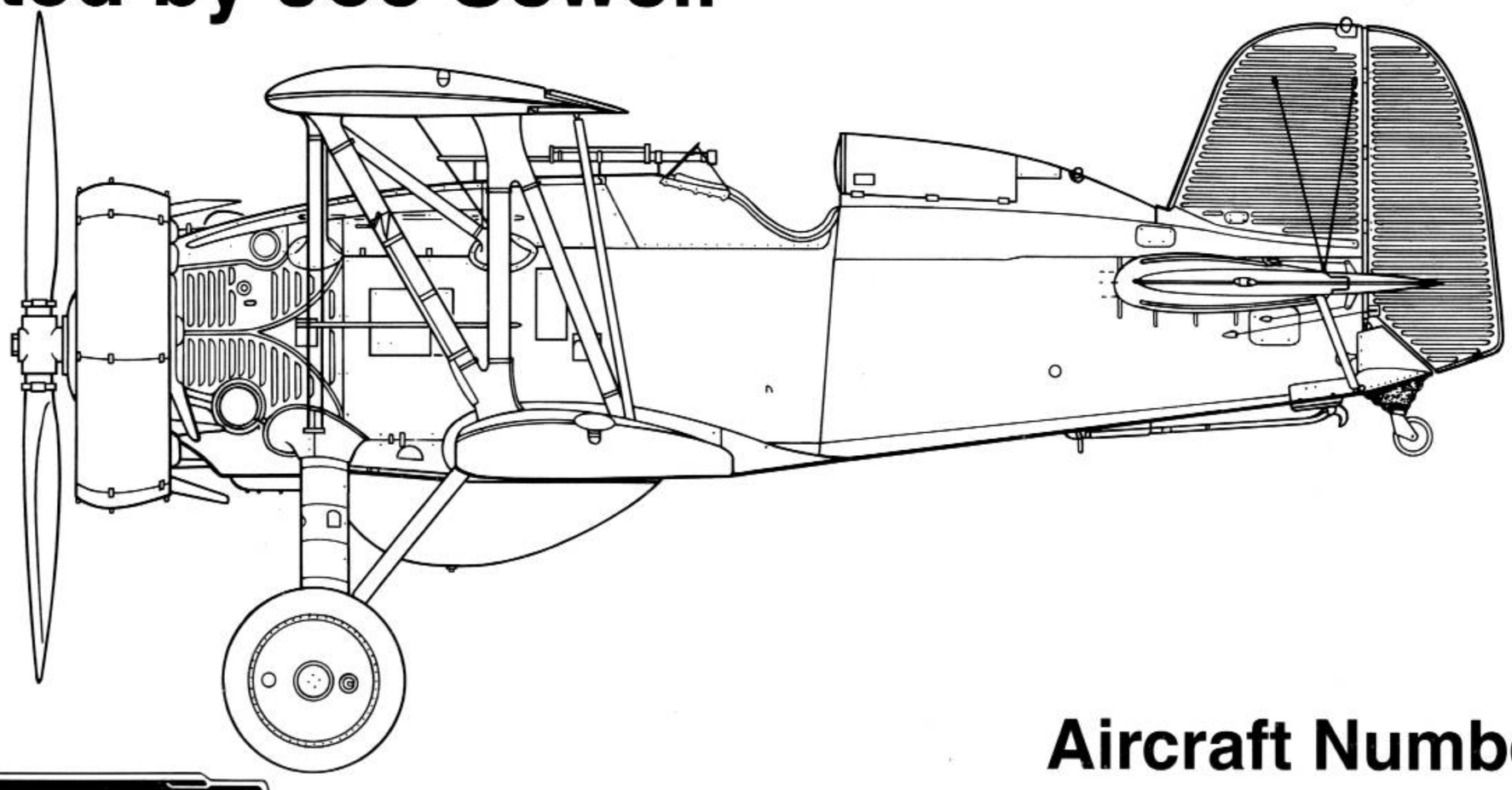

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A P-12E of the 6th Pursuit Squadron, based at Wheeler Field, is joined by an F4B-4 of Fighting Six off USS LANGLEY over Pearl Harbor, Hawaii during 1932.

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Dedication:

To all aviation historians throughout the world and to groups such as the American Aviation Historical Society that continue to preserve the heritage of American aviation.

The classic beauty of the Boeing P-12/F4B design is well illustrated by this new production F4B-3 of the United States Navy. (Warren Bodie)

F4B-3 8310
U.S.NAVY

Introduction

What do you think of when someone mentions the Boeing Airplane Company? If you're at all informed in aviation then you'll think BIG! Big,. as in the B-17, B-29, B-52 or Boeing 747. Almost every aircraft that Boeing is famous for has been big. Boeing,, however, did not start out building big aircraft. In fact, the Boeing Airplane Company was built on the fame of some of the smallest pursuit aircraft in history. And some of the best. Before the prototype XB-17 was even a dream in the eyes of the engineers, Boeing had built the Army PW/Navy FB fighter series, followed by the superb P-12/F4B fighters, which were then followed by the renowned P-26 Peashooter. The Curtiss Hawks may have been better known to the general public, but it was the Boeing pursuits that were the backbone of the U.S. Armed Forces. Boeing would build a total of 586 aircraft on the various P-12/F4B contracts for service with Army, Navy, and Marine air arms.

The Boeing Airplane Company was founded in 1916 by William E. Boeing. Known then as the Pacific Aero Products Company, it was located in a converted boathouse on Lake Union near Seattle, Washington. Quite naturally the first aircraft built by Boeing was a floatplane design. The B & W sport seaplane led to a contract with the U.S. Navy to build fifty Model C floatplanes during 1917. It was this same year that the company officially became known as the Boeing Airplane Company. Following completion of the Model C contract, Boeing was awarded a contract to build fifty Curtiss-designed HS-2L flying boats, the standard Navy patrol airplane in the First World War. Following production of several other flying boat designs, Boeing won the contract to build ten GA-1 and two GA-2 ground attack aircraft that had been designed by U.S. Army engineers at McCook Field.

Boeing got its first big break when they were low bidder on an Army contract to rebuild several hundred deHavilland DH-4s for Army service. Boeing rebuilt 111 of the DH-4Bs during 1920. A further 187 DH-4s were completely refurbished with Boeing-designed steel tubing fuselage frames replacing the original wooden frames. These aircraft were designated DH-4M (for Modernized) in Army service and the 02B-1 for U.S. Marine Corps use. These modernized DH-4Ms were the first Boeing aircraft to be put up for export sale, with Cuba purchasing six.

Boeing's first contract to build a true fighter came in 1921 when they underbid the Thomas-Morse Airplane Company to win an Army Air Service contract to build Thomas-Morse designed MB-3 fighters. In the 1920s it was not unusual for a company to win an airplane design competition, then lose the builders contract. Boeing did just that when Army awarded them the contract to build two hundred MB-3s at a cost of $1,448,000. The Thomas-Morse MB-3 design was considered by many to be one of the best fighter designs to come out of the First World War. Powered by a Wright/Hispano H-3 inline engine rated at 320 hp, the MB-3 had a top speed of over 140 mph, which was much greater than either the Spad or Fokker D VII. The aircraft was armed with a pair of .30 caliber machine guns firing through the propeller. Boeing engineers improved on the original design by substituting a metal tube fuselage frame for the original wooden design and redesigning the tail surfaces. In addition, Boeing

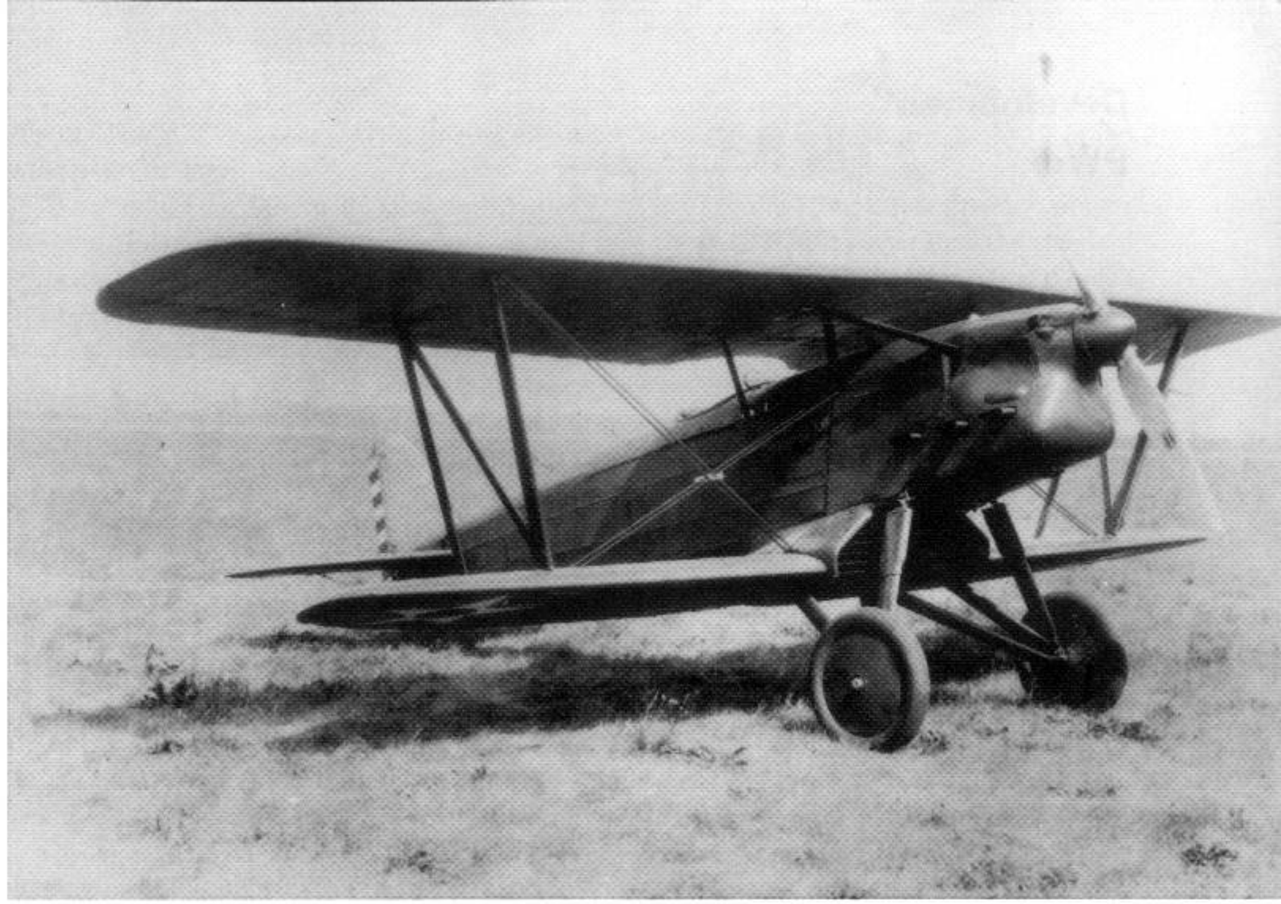
The Boeing-built MB-3A was the first successful single seat fighter aircraft built by the Boeing Aircraft Company. Boeing built 200 of the Thomas-Morse MB-3 design. The MB-3 was one of the best fighter designs to come out of the First World War and Boeing improved on the basic aircraft by substituting a metal tube frame for the original wooden frame. (AFM)

Boeing MB-3As from the 95th Pursuit Squadron at Saint Louis Flying Field during the early 1920s. The Boeing MB-3As differed from the original Thomas-Morse design in having the radiators mounted on the fuselage sides rather than having them built into the upper wing. (AFM)

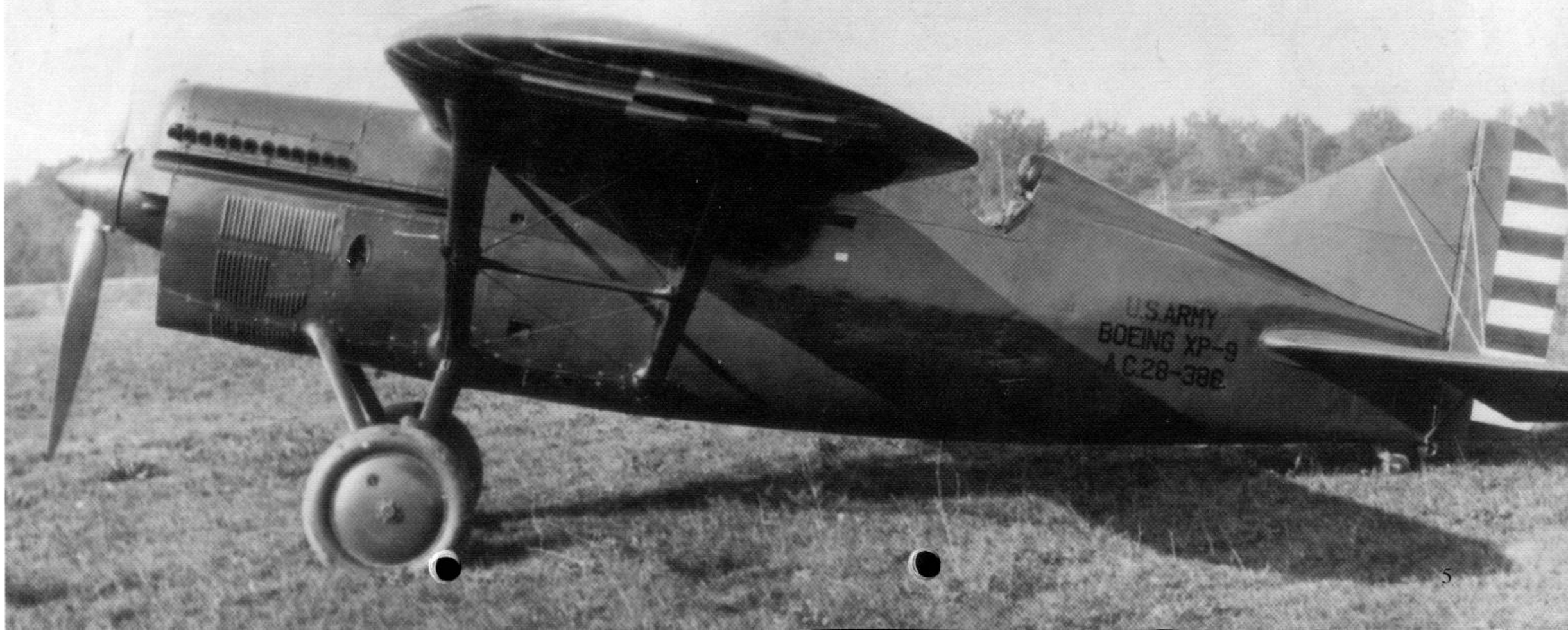
relocated the radiators from the upper wing center section, to the fuselage sides, improving engine cooling. The radiator relocation also improved safety, since in the event of an engine overheat and radiator boilover, the pilot would not be sprayed with the hot water from the radiator. The lighter weight of the Boeing-built aircraft meant an increase in the top speed to 152 mph (twelve mph over the original MB-3). Boeing-built aircraft were designated the MB-3A by the Army Air Service. After a period of use as a first line fighter serving with units like the 95th Pursuit Squadron, a number were rebuilt by the Fairfield Air Intermediate Depot (FIAD) and reissued to Kelly Field, Texas where they were used as advanced trainers, serving until 1927. Several aircarft were used in the movie "Wings" to simulate German Albatros fighters.

The last MB-3A on the contract was delivered on 27 December 1922, Boeing's next fighter aircraft to enter production would be a design of their own.

(Right) This aircraft was an original Boeing design built at company expense under the designation XP-8. The single XP-8 was powered by a Packard 2A-1500 engine rated at 600 hp. The radiators were mounted between the landing gear legs. (AFM)

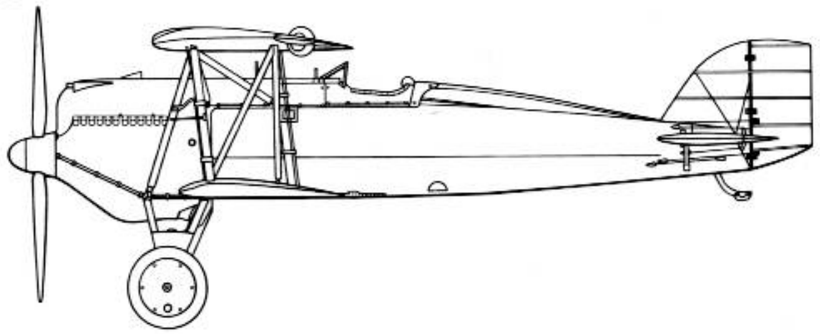


Another Boeing original design was the XP-9 which had an all-Dural semi-monococque fuselage and was powered by the standard 600 hp Curtiss D-12 engine. Many of the XP-9 design features were used on the later P-12/F4B series. Top speed of the XP-9 was 213 mph, but the XP-9 suffered a variety of ground handling and airborne maneuvering problems. (AFM)

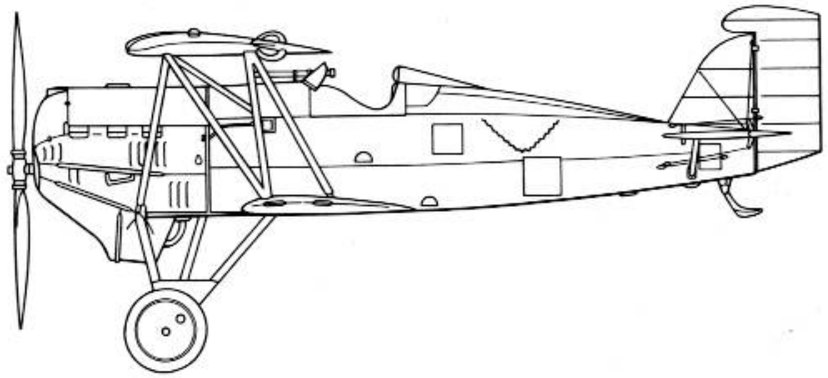


Development

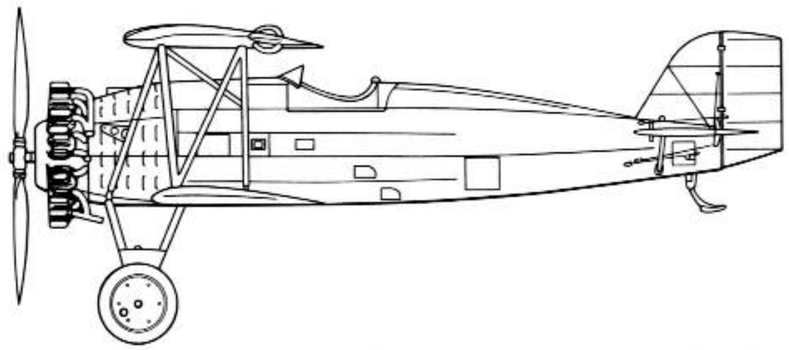
PW-9



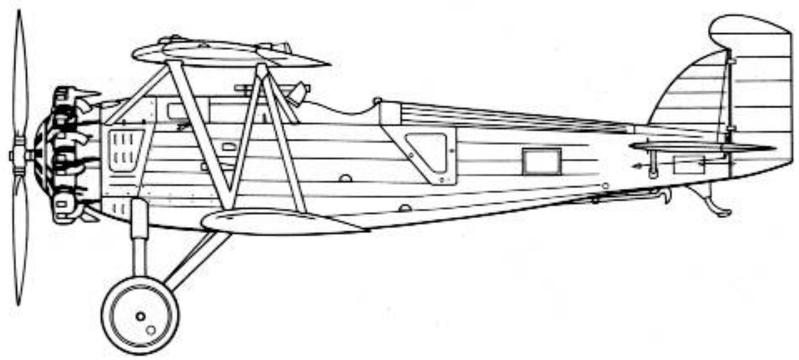
FB-5



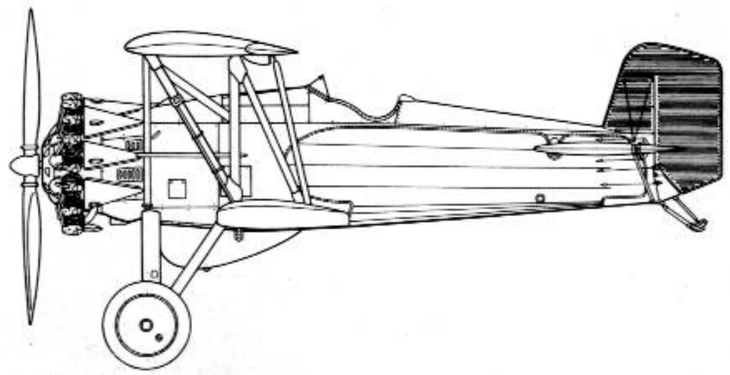
FB-6



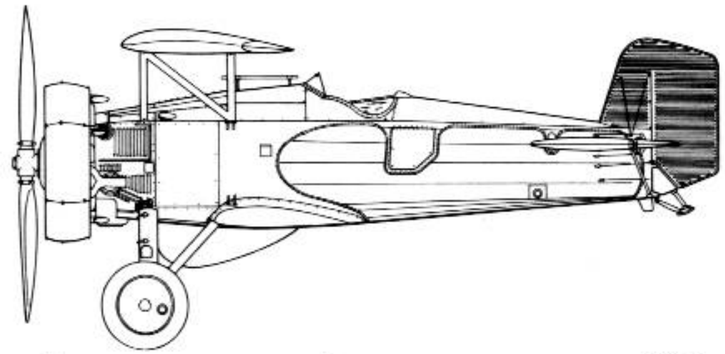
F2B-1



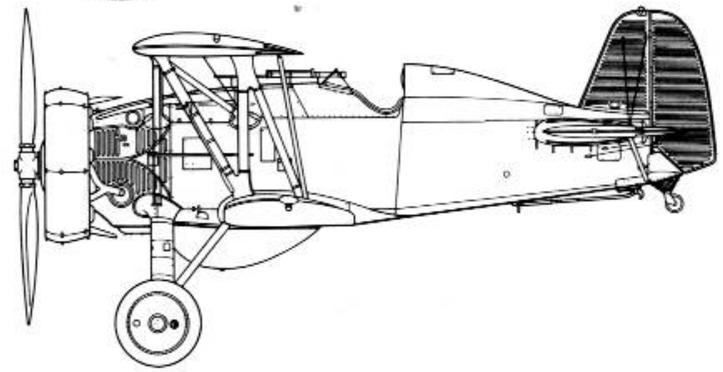
P-12/F4B-1



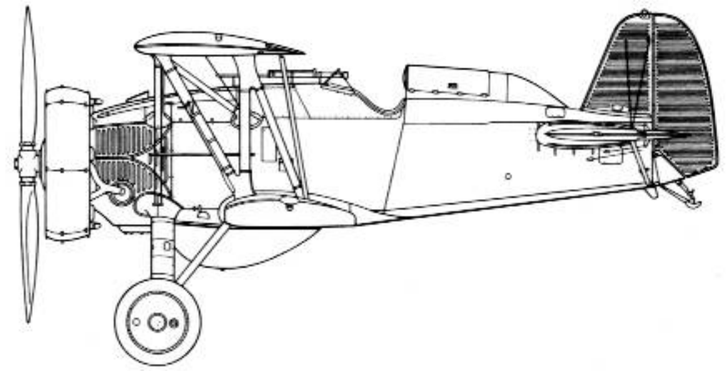
P-12C



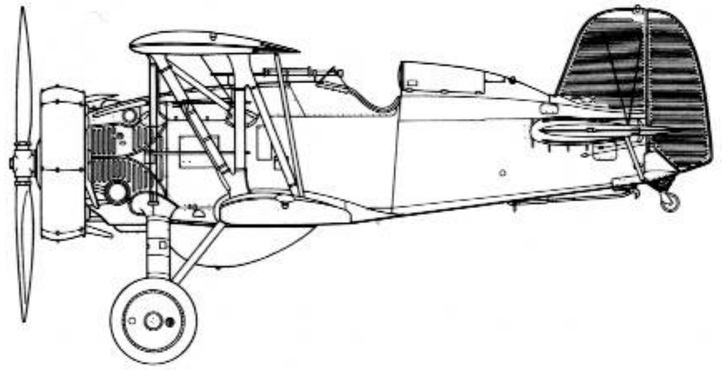
F4B-3



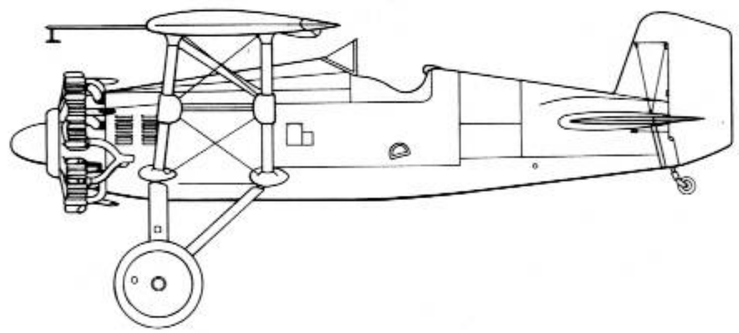
P-12E



F4B-4



XP-15



PW-9

As Boeing was beginning production of the MB-3A in 1922, Boeing's Chief Engineer Claire Egtvedt began a design study on an aircraft of their own — the Boeing Model 15. The fuselage design was a direct development from the German Fokker D VII fighter of the First World War, with one major difference; the Model 15 would have a welded steel frame instead of wood. The wing was a Boeing-designed tapered sesquiplane type that was also based on a German design. But the Boeing wing was much lighter resulting from routing out the main ribs and using thinner wood overall. Armament was standard for the era, a single .30 caliber and single .50 caliber machine gun mounted in the engine cowl and firing through the propeller arc.

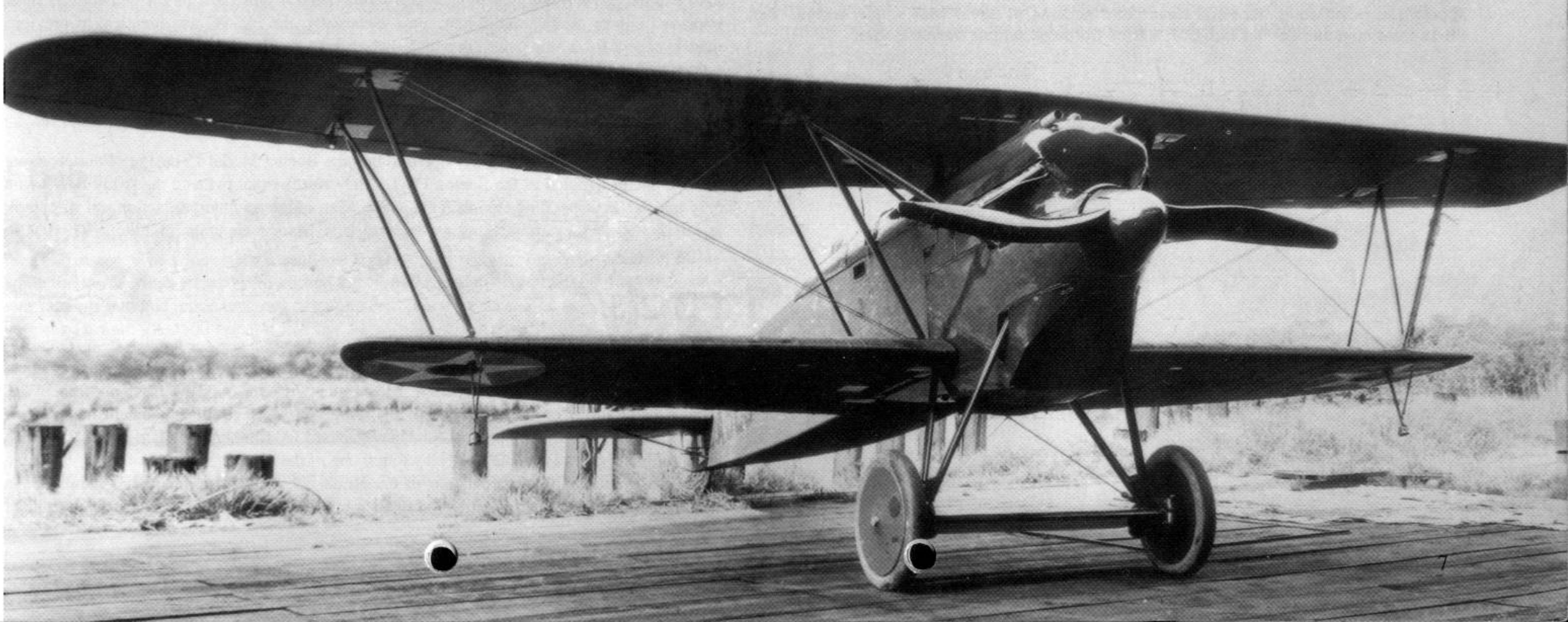
Power for the Boeing fighter was to come from the Wright-Hispano H-3 engine rated at 300 hp. Before the Model 15 design had progressed very far; however, a new engine design became available -- the Curtiss D-12. The D-12 was a water-cooled, 1,150 cubic inch V-12 design rated at 435 hp. But Curtiss was quite reluctant to sell Boeing one of their new engines in as much as they were also developing a new fighter design powered by the D-12, the Curtiss PW-8. But the U.S. Army owned the design rights to the D-12 and "loaned" one to Boeing for "test" purposes. The Boeing engineers lost no time in installing the D-12 in the Model 15 fuselage.

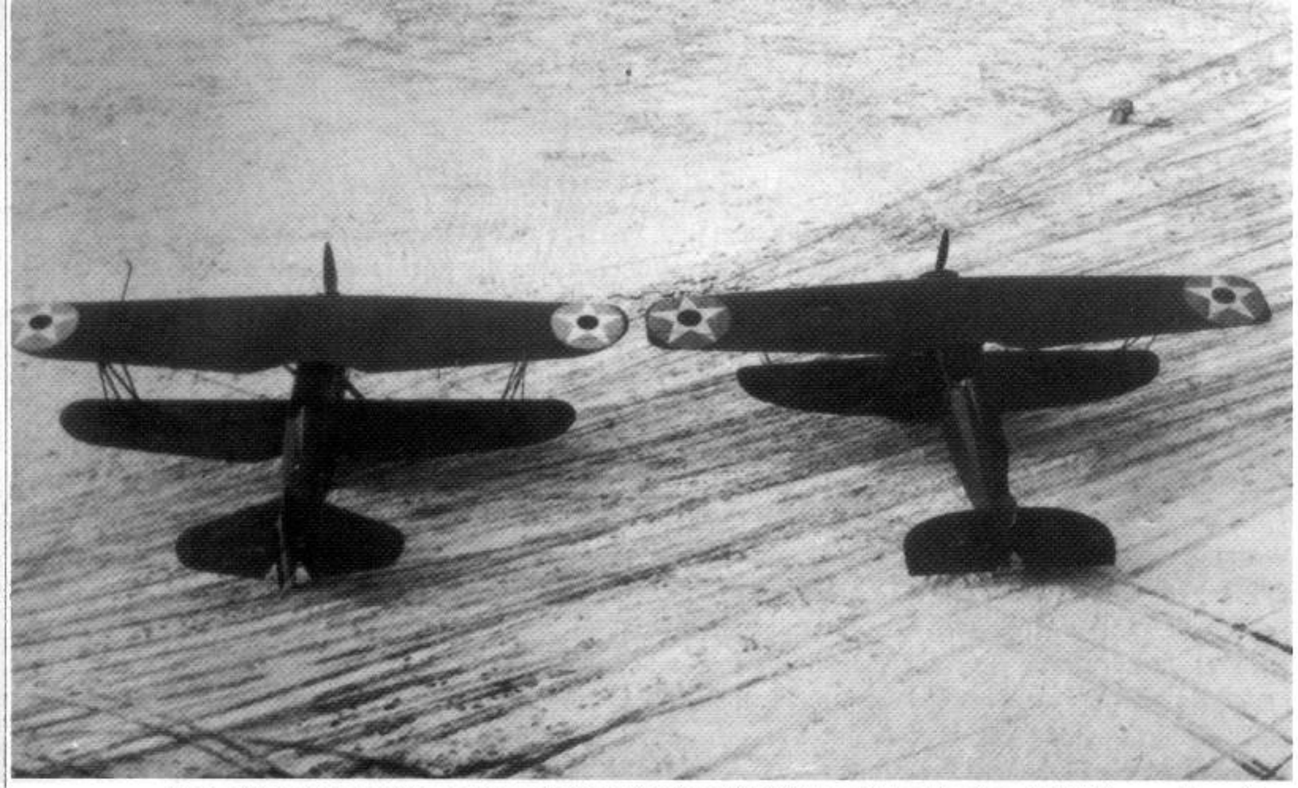
What made the Model 15 (and the Curtiss PW-8) different from contemporary fighter designs of the era was the use of a welded steel tube fuselage frame, rather than the standard wooden frame used by most other manufacturers. Not only was the steel tube frame a much stronger frame than the wooden frames, it was also lighter. The Model 15 also had the coolant radiator mounted directly under the engine within a shrouded tunnel that directed outside air through the radiator. The radiator placement and tunnel design were so efficient that Curtiss copied it for the PW-8. Fuel was held in two tanks, a 15 gallon tank in the upper center wing and a 54 gallon tank in the fuselage. Gross weight of the Model 15 was set at 2,971 pounds.

In the late Spring of 1923, the Model 15 was finished and trucked to Camp Lewis, Washington for initial flight tests. On 2 June 1923, Army Air Service pilot LT Frank Tyndall took the Model 15 into the air for the first time. Following an uneventful but highly successful first flight, the Model 15 was transported to Sand Point Army Flying Field for further tests. Disaster almost struck when LT Tyndall ground looped the Model 15 and flipped it onto its back. Both wings were bent, as was the landing gear, and one propeller blade was broken in half. Boeing engineers made some quick repairs on the wings and landing gear, and installed an entirely new propeller. Once repairs were completed, the Model 15 was again crated up and trucked to McCook Field for Army acceptance tests.

On 20 June 1923, the rebuilt Model 15 took to the air once again. The Army liked what Boeing had built in many ways. The reduced amount of rigging meant less maintenance. The armament was easy to service and rearm. And the tunneled radiator design was very well-

The second XPW-9, Army serial 23-1217, parked on the Boeing seaplane ramp during 1923. The XPW-9 introduced both the tapered wing design and the tunnel radiator, both of which were later adopted by the Curtiss Company for their successful Hawk series of Army/Navy/export fighters. The XPW-9 also used a "third wing" airfoil added to the landing gear axle bar. (AFM)





The difference between the original Curtiss XPW-8 and the Boeing XPW-9 was the wing designs. The tapered upper wing and smaller lower wing gave the Boeing design a marked increase in maneuverability over the Curtiss design. Later, Curtiss adopted the tapered wing for their Hawk series. (AFM)

The FB-1 was a U.S. Navy version of the production Army PW-9 series, differing only in specialized naval equipment and Navy paint scheme of Silver with Yellow wings. Ten FB-1s were built and served with U.S. Marine Corps air units. (Warren Bodie)

liked by the test pilots, who were tired of having boiling hot water splashed in their face from the wing-mounted Curtiss radiator designs. Top speed was 167 mph, faster than the Curtiss design. In all respects the Model 15 outflew the Curtiss design. Curtiss; however, was an established aircraft manufacturer and the Army contracted for twenty-five PW-8s on 14 September 1923 before flight tests on the Model 15 were completed. But the Army did like the Boeing design and bought the prototype plus two others that were in production on 29 September 1923. The new airplane was designated the XPW-9, or Experimental Pursuit Plane, Water-cooled, Model 9. Following a year of tests with the 1st Pursuit Group at Selfridge Field, Army ordered full production of the PW-9 on 19 September 1924.

The PW-9 differed from the prototype in having the cross-axle and "Third Wing" landing gear replaced by a divided steel axle system with shock absorbers where the legs joined the fuselage. The engine cowling was refined and the exhaust "dumps" were replaced by individual exhaust stacks. The PW-9 also had a reinforced vertical fin and the upper wing fuel tank was eliminated. Larger wheels and tires were added later in the production run. The first of thirty production PW-9s came off the Boeing assembly line on 30 October 1925. Following Army acceptance tests at Sand Point Field, the PW-9s were shipped directly to Army units in Hawaii, The Philippines, and the Panama Canal Zone.

PW-9A

The PW-9A was essentially the same aircraft with some minor internal changes and a steerable tail skid. The Army purchased twenty-five PW-9As. One PW-9A had an improved engine installed, the Curtiss D-12D, and was tested as the PW-9B. The PW-9C was an Army production order for the re-engined PW-9B with still more improvements. Along with the D-12D engine, the PW-9C had improved oil and fuel systems, still larger wheels and tires, improved engine mounts and a new seat. Externally, the PW-9C was identical to previous models except for a new paint job which included the newly adopted Boeing-designed Army rudder stripes. The Army accepted the first of forty PW-9Cs on 9 July 1927.

FB-1

In December 1924, the US Navy opted to buy the Boeing Model 15 design. Fourteen were ordered and designated as the Boeing FB-1. They were virtual twins to the Army PW-9 with only minor Navy-specified equipment changes. Ten of the original production run were built as land-based fighter aircraft and assigned to U.S. Marine air units, including VF-10M in China.

FB-2/3/4

The FB-2 was an FB-1 with reinforced landing gear and an arrester hook system for carrier landings. Two were built and evaluated before being returned to FB-1 standard and assigned to the Marines. The FB-3 had two significant changes over both the FB-1 and the PW-9. First, it had fittings on the underside of the wing and fuselage for attachment of a pair of floats. Second, it was equipped with the new Packard IA-1500 engine rated at 510 hp. With the additional power available, the Navy found one of the same problems that Army had been complaining about since the first tests of the Model 15, inadequate directional stability. An entirely new, taller rudder assembly, with a large rounded balance area ahead of the rudder

A PW-9C of the 24th Pursuit Squadron at France Field in the Panama Canal Zone. The production PW-9 series used a split-axle landing gear with Vee struts. The spoked landing gear wheels had canvas cloth covers that were often removed in service. (Fred Dickey)

hinge line, was added to the three FB-3s This feature was eventually fitted to both the Army PW-9D and the Navy/Marines FB-5. The FB-4 had a Wright P-1 radial engine, rated at 406 hp, and was shipped to Anacostia for further tests.

PW-9D

The PW-9D was the final Army variant of the basic Model 15 airframe. It incorporated the taller rudder as found on the Navy FB-3, but retained the Curtiss D-12D engine. Other changes included even larger wheels and tires, but now fitted with mechanical brakes for the first time. The radiator and tunnel were redesigned and another new tail skid was added. The first PW-9D was delivered on 25 April 1928. While most of the previous PW-9s had gone to units outside the continental United States, all the PW-9Ds were assigned to the 95th PS and the 43rd School Squadron at Kelly Field. Texas.

FB-5

Navy accepted twenty-seven FB-5s beginning in July of 1927. The FB-5 had the taller rudder and Packard engine found on the FB-3. There was; however, a major design change with the FB-5 series. The wings were re-staggered. The upper wing was moved forward 6 inches while the lower wings were moved aft one full fuselage station. Additionally, the FB-5 had a new landing gear and redesigned engine and radiator cowl contour. The engine was upgraded with the Packard 2A-1500 rated at 525 hp. As with the FB-3, the FB-5 had float provisions although none were fitted. FB-5s served with both land-based Marine air units and carrier-based Navy air units.

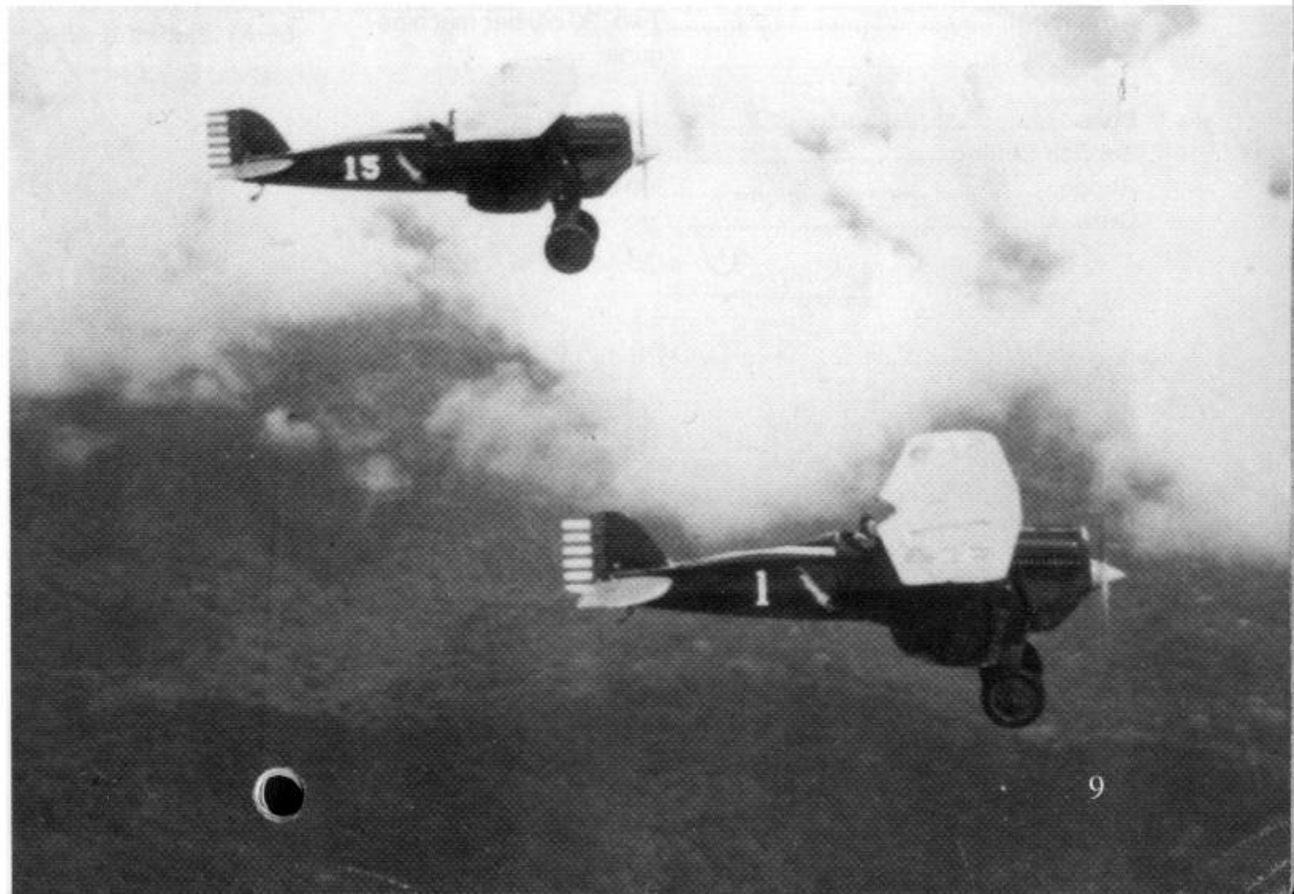
FB-6

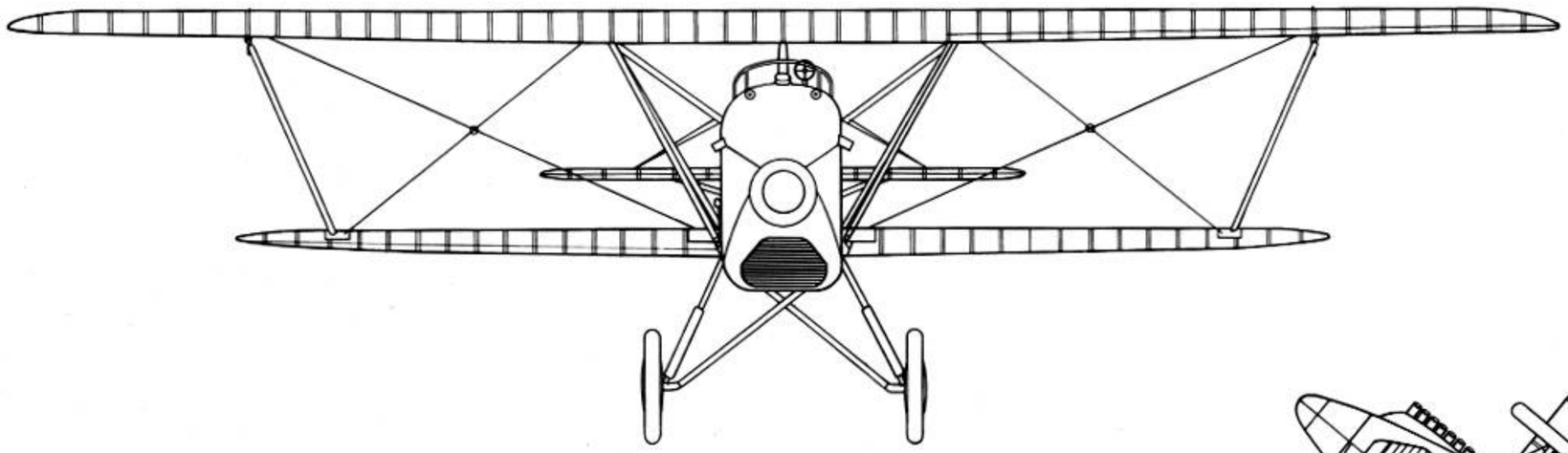
The FB-4 that had been fitted with the Wright P-1 radial engine was re-engined with one of the brand new Pratt and Whitney R-1340 Wasp radials rated at 400 hp and redesignated FB-6.

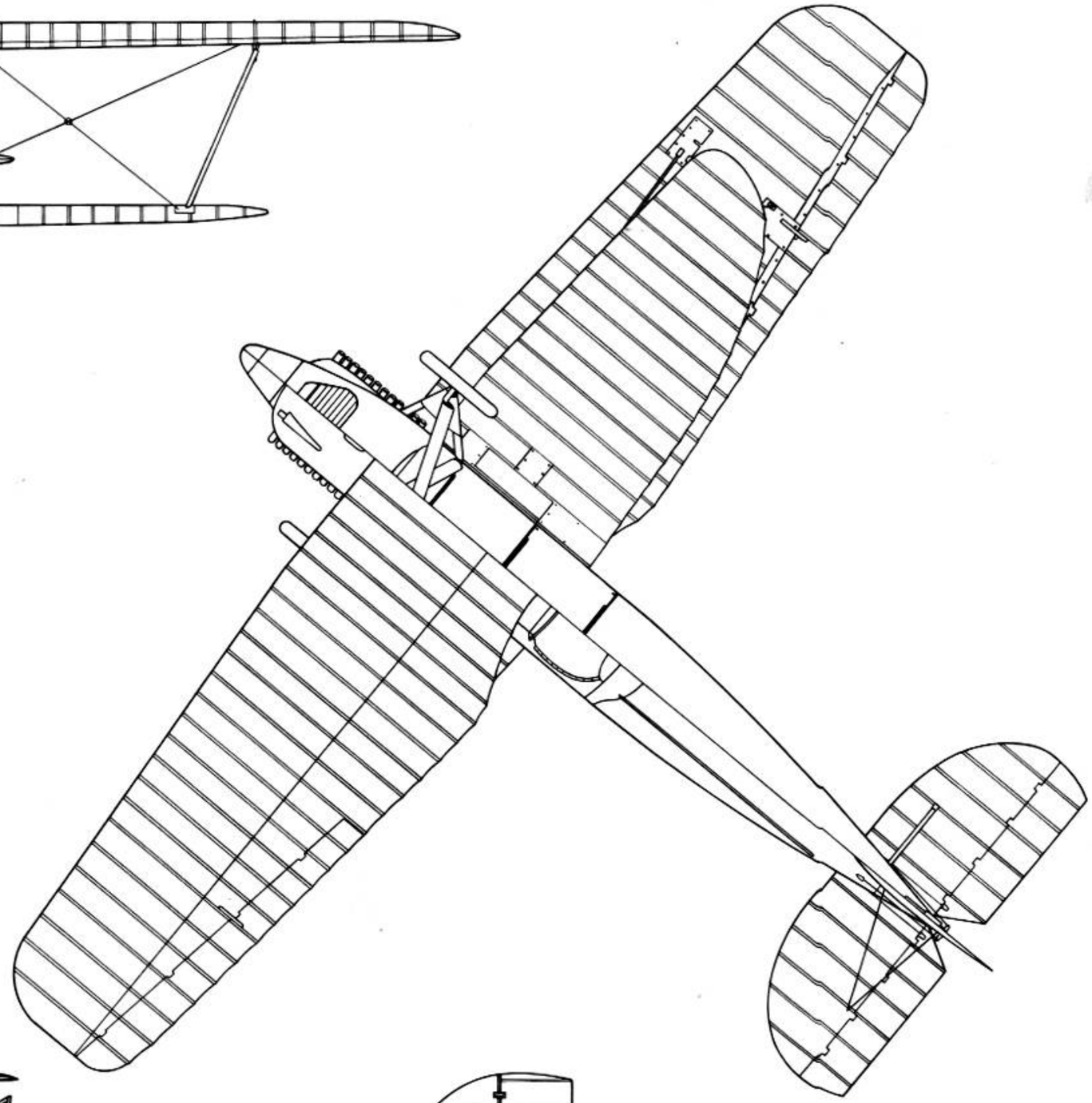
A line-up of Marine Corps FB-1s of VF-1M during 1926. Marine FB-1s saw combat with the USMC Expeditionary Force in China during 1928. The circle around the 'F' in the code indicates a Marine Corps fighter aircraft. (USMC)

Although slightly slower than either the FB-1 or FB-5, the FB-6 was a superb combination. It was very easy to maintain, a definite plus to carrier air units, and when fully developed would be easily competitive with any inline or Vee design. Navy decided to fund the FB-6 project, which would eventually wind up with the Boeing F4B/P-12 series.

LT J.E. Parker (#1) and LT R.W. Douglas (#15), of the 24th Pursuit Squadron, at the beginning of a long distance flight from France Field, Panama CZ, to Washington, DC on 12 May 1928. Both Army and Navy aircraft flew many "distance flights" to keep military aviation in the public eye during the dark days of the Depression. (AFM)







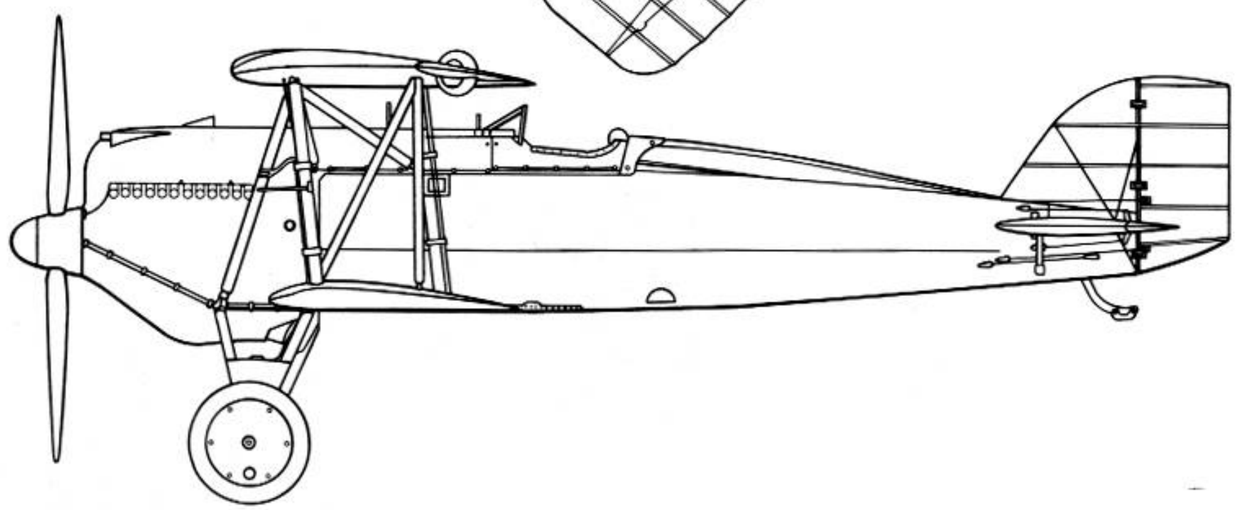
Specifications

Boeing PW-9

Wingspan.....32 feet (9.75 m)
Length.....23 feet 5 inches (7.16 m)
Height.....8 feet 2 inches (2.44 m)
Empty Weight.....1,936 pounds (876 kg)
Maximum Weight.....3,120 pounds (1,415 kg)

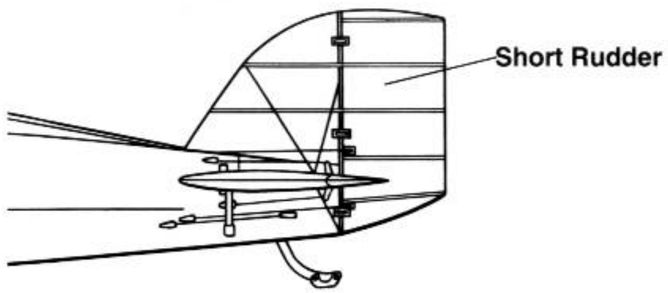
Powerplant.....One 435 hp Curtiss D-12 liquid cooled engine
Armament.....Two .30 caliber machine guns

Speed.....159.1 mph (255.9 kph)
Service Ceiling.....18,925 feet (17,305 m)
Range.....390 miles (627.6 km)
Crew.....One

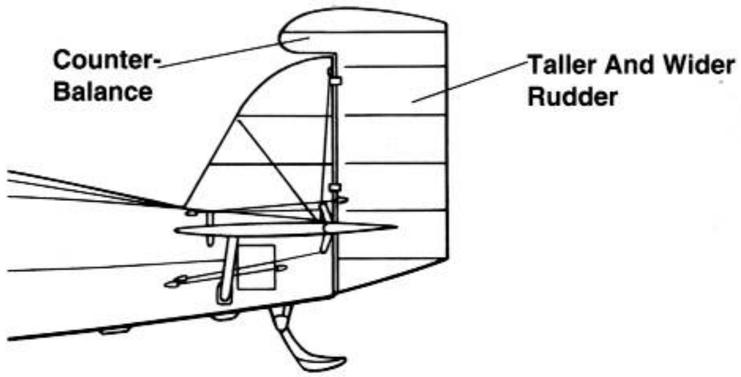


Fin and Rudder Development

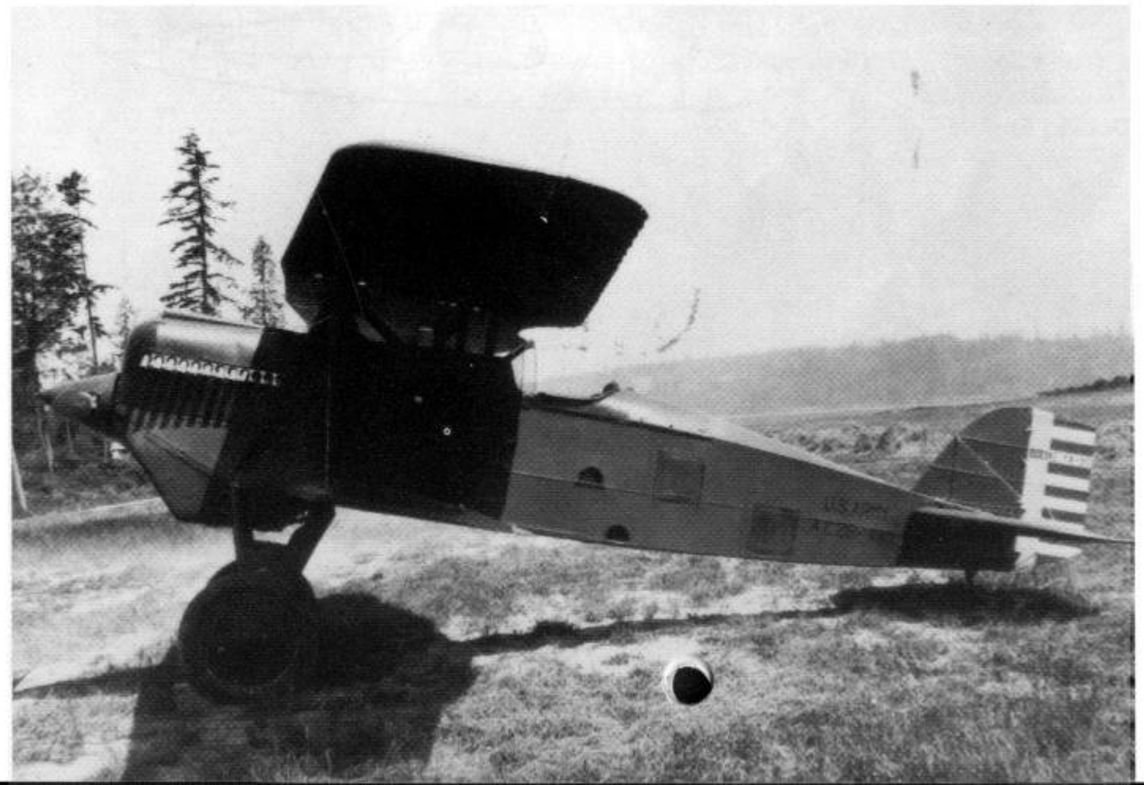
PW-9

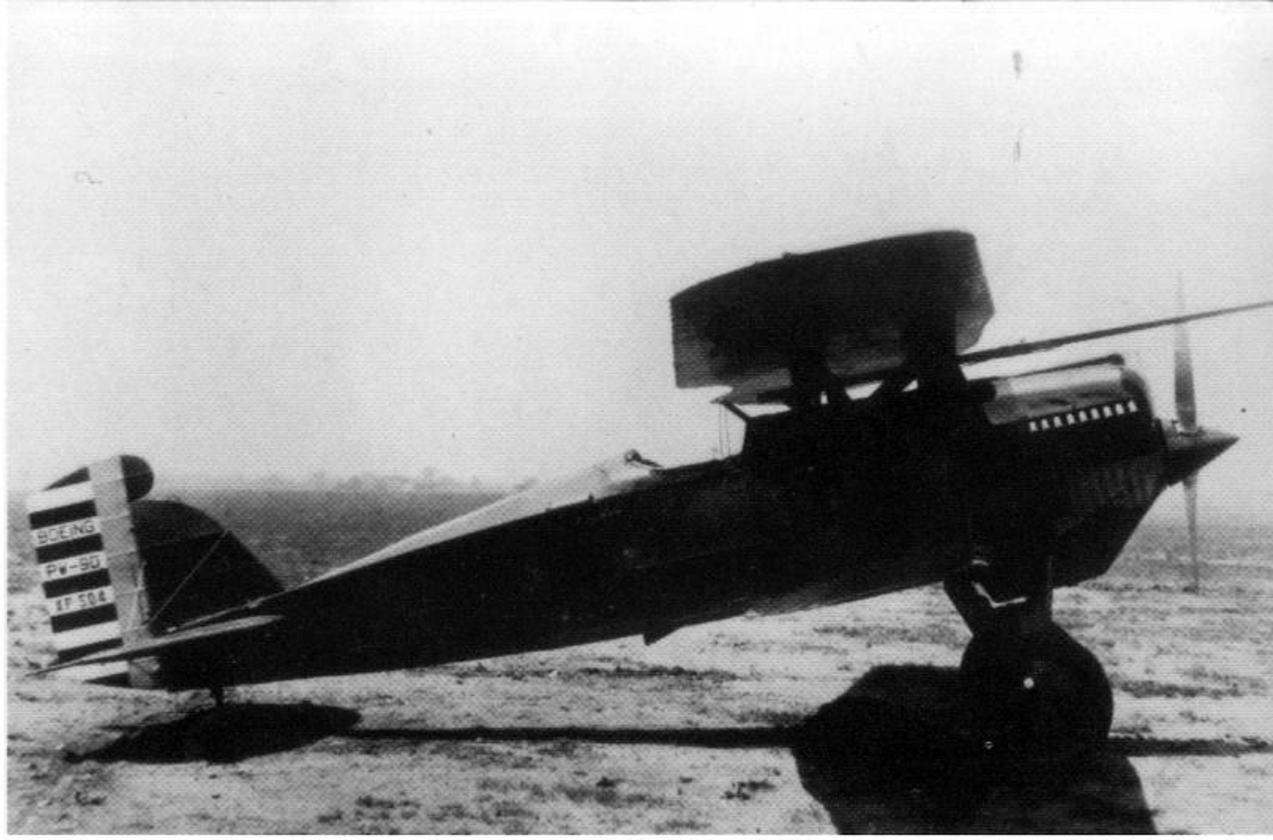


PW-9D



The first PW-9C (serial 26-443) on the grass at Sand Point on 21 June 1927. The PW-9C differed from previous variants in having a reinforced fuselage frame, larger wheels and tires. The vertical tail stripes were changed to Boeing-designed horizontal stripes (seven Red, six White, and a vertical Blue band) which were adopted by Army during 1926. (Jack Binder)





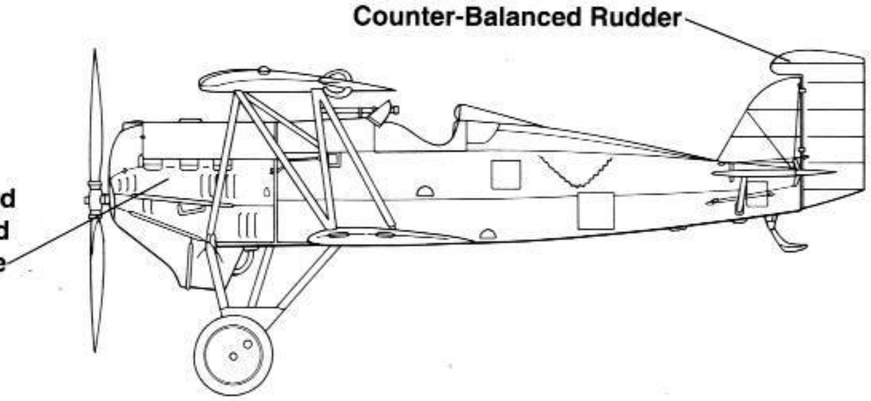
The last PW-9C (serial 27-202) was modified with a taller rudder with a large counter-balance on the front of the fin and became the prototype for the PW-9D. The large instrument boom under the wing of the PW-9D prototype was installed during tests at Wright Field. (Jack Binder)

PW-9Ds of the 24th Pursuit Squadron on the grass ramp at France Field, in the Panama Canal Zone, on 30 December 1928. The 24th PS was the fighter arm of the 6th Composite Group that defended the Panama Canal. The two aircraft in the background are Keystone LB-5A bombers. (AFM)

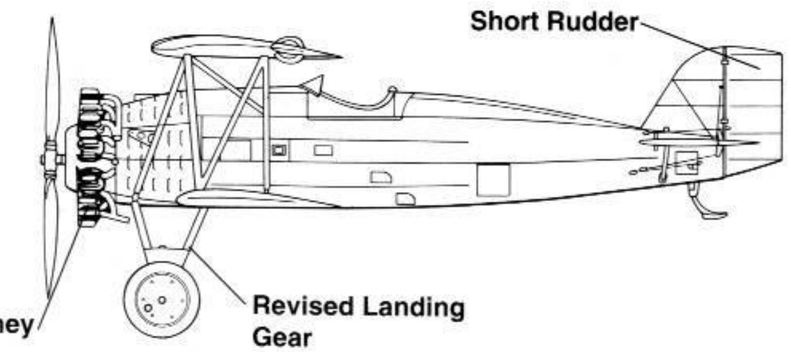
One of only two FB-2s built for the U.S. Navy. The FB-2 was identical to the FB-1 except that the landing gear and fuselage were reinforced for aircraft carrier operations, a tail hook was added for deck landings, and the landing gear was changed to a cross-axle type with carrier deck guide wire hooks fitted. (Warren Bodie)

The FB-3 was an FB-1 that could be fitted with twin floats in place of the wheeled landing gear. Additionally, the FB-3 was powered by a Packard 1A-1500 engine rated at 510 hp. Three FB-3s were built, with one being used to set a closed course speed record at the 1926 National Air Races. (Warren Bodie)

FB-5



FB-6



This FB-5 is from VF-6M, the Red Devil Squadron, which later evolved into VMF-232. Marine Corps FB-5s retained a landing gear similar to that of the FB-1 since they did not operate from aircraft carriers. (U. S. Navy)

An FB-5 of Fighting and Bombing Six (VF-6B) on USS LANGLEY. The FB-5 had a Packard 2A-1500 engine rated at 520 hp and differed from all previous PW-9/FB variants in having the wings staggered at a more exaggerated angle. (U.S. Navy)

A trio of FB-5s from Fighting One (VF-1) and Fighting Six (VF-6) at the 1927 Spokane Air Races. The FB-5 also had the large counter-balance added to the rudder that was introduced on the PW-9D. Red-tailed VF-1 flew from USS LANGLEY, while White-tailed VF-6 was aboard USS SARATOGA. (Warren Bodie)

A batch of new FB-5s from the Boeing factory on the USS LANGLEY for the first carrier operations trials. The Navy color scheme at this time was overall Silver paint with a Chrome Yellow upper wing and vertical rudder stripes. The FB-5 was the last Navy fighter powered by an inline, liquid-cooled engine. (Boeing)

The FB-6 was an FB-1 modified to accept a Wright radial engine and redesignated the FB-4. It was then fitted with the Pratt & Whitney R-1340 Wasp radial and redesignated the FB-6. The Wasp radial had less horsepower but was lighter than the Curtis D-12. As a result, the FB-6 offered the same performance with far less maintenance. (Warren Bodie)

F2B/F3B

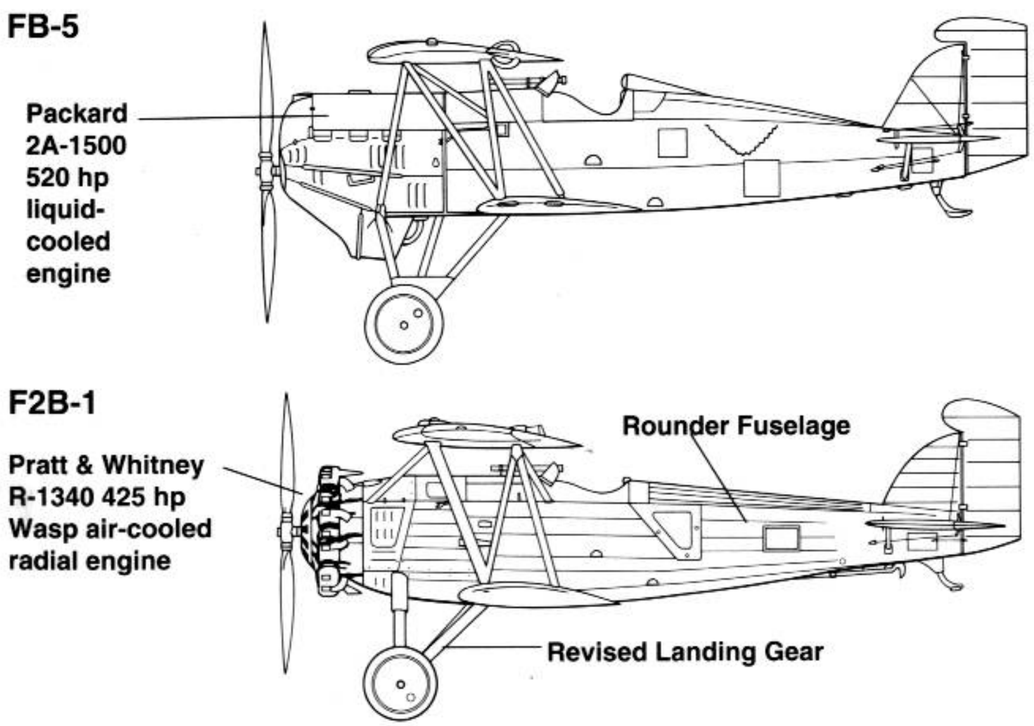
Prior to the Boeing F2B, all previous aircraft flown off aircraft carrier decks had been land planes modified and reinforced for carrier operations. The Boeing F2B was designed specifically from the outset for carrier operations.

The F2B, Boeing Model 69, was a direct descendant of the FB-5 and resembled it in many ways. The fuselage utilized the welded steel tube frame introduced on the PW-9/FB series, but was much rounder in appearance. The vertical tail and rudder assembly was also similar to the PW-9D with a large balance area that extended forward of the rudder hinge line. The wings were the same as found on the FB-5 with the exaggerated stagger. The aircraft was powered by a Pratt & Whitney R-1340 Wasp radial engine rated at 425 hp. One major difference was the landing gear which was simplified and strengthened.

The first F2B-1 came off the Boeing assembly line in October of 1926, with the first flight taking place on 3 November 1926. Boeing built thirty-two F2B-1s with deliveries to the U.S. Navy beginning in late January of 1928. The Navy accepted thirty F2B-1s, with the final two going to Japan and Brazil for evaluation tests.

The F3B-1 was a refinement of the F2B-1 design. The fuselage was of a similar design but was two feet longer than the F2B-1. The vertical tail/rudder assembly was completely redesigned with almost twice the area of any previous Boeing fighter. And both the vertical and horizontal tail surfaces were of an all-metal construction with corrugated aluminum skin rather than fabric-covered wood. The wings were an entirely new design. Although employing the exaggerated stagger of the F2B-1, the F3B-1 upper wing was tapered (swept) back with no straight-across center section. Additionally both the upper and lower wings had rounded wingtips. The ailerons were also all-metal with corrugated aluminum skin. Finally,

Fuselage Development



The Boeing Model 69 prototype became the prototype XF2B-1 which flew for the first time on 3 November 1926. The XF2B-1 had a Pratt & Whitney R-1340 engine rated at 425 hp, giving it a top speed of 154 mph. (Boeing)

the F3B-1 had mounts for the installation of a single center float on the fuselage centerline and outboard floats on the lower outer wing panels. Power for the F3B-1 was again supplied by a 425 hp Pratt & Whitney Wasp radial.

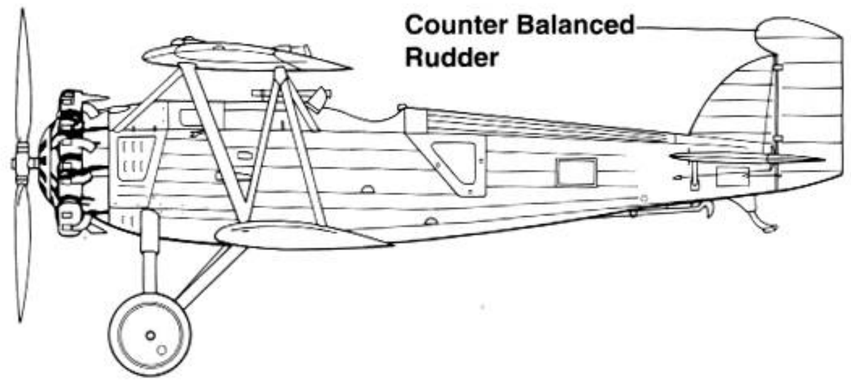
The original F3B-1 design actually differed very little from the F2B-1, with the float mounts being the only external difference. The F3B-1 made its first first flight on 2 March 1927. Showing no improvement over the F2B-1, the Navy rejected the Boeing proposal. Boeing rebuilt the F3B-1 with the new tapered wing, round wingtips, and all-metal tail surfaces. The rebuilt aircraft made its first flight on 3 February 1928, with deliveries to the Navy beginning in November of 1928. Armament remained the same as previous models, a pair of .30 caliber machine guns in the upper cowl, or one .30 and one .50 caliber guns. One difference between the F2B-1 and F3B-1 was addition of underwing and fuselage racks and release mechanisms for carriage of up to five 25 pound bombs. The U.S. Navy accepted seventy-three production F3B-1s.

This F2B-1 from Bombing Two carries special markings used in the making of the movie "Flying Fleets" which was released in 1928. Production F2B-1s had the same counter-balanced rudder as used on the earlier FB-5. (USN Via Bob Lawson)

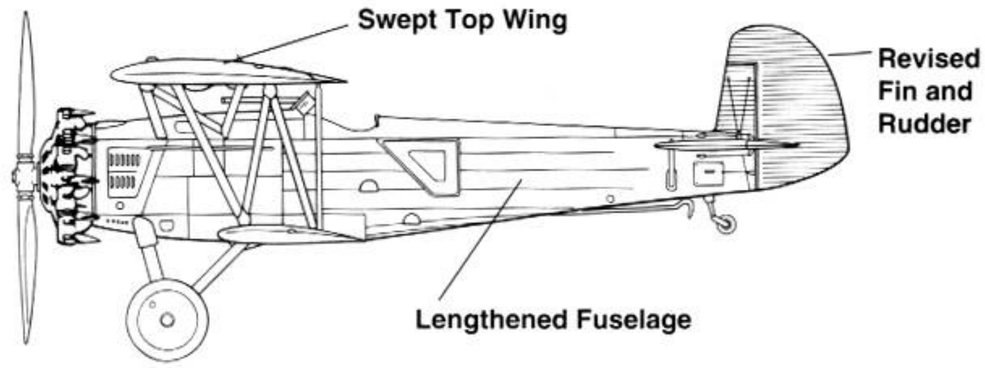
An F3B-1 of Utility Squadron Five (VJ-5). After being rebuilt by Boeing in 1928, many F3B-Is served as dive-bombers into the 1930s, then were transfered to non-combatent units, such as VJ-5. The forward fuselage of this F3B-1 was painted Admiral Blue. (Bob Esposito)

A Red tailed F3B-1 of Fighting Two (VF-2) aboard USS LANGLEY (CV-1). The F3B-1 had a split-axle landing gear and a revised taller rudder without a counter-balance. (U.S. Navy)

F2B-1



F3B-1



F4B/P-12

The Boeing Model 83 was the next step in the Boeing fighter aircraft series. With the success of the F2B-l/F3B-1 behind it, Boeing made a decision to build a small, lightweight fighter prototype, powered by an air-cooled radial engine, that would outperform all other fighter aircraft in service with any nation. Using many of the best assets of the of the previous variants, plus the addition of a completely new fuselage design, the Model 83 would eventually evolve into the top pursuit aircraft of both the Air Corps and Navy/Marine air units during the early 1930s.

The Model 83 used the metal fuselage frame as seen on previous Boeing fighter designs - with a difference. Where the previous models had utilized a welded steel framework, the Model 83 would have an aluminum framework that was bolted together. The Model 83 also had an all-aluminum tall assembly with corrugated aluminum skin, similar to that found on the F3B-1. The fuselage; however, was over four and a half feet shorter than the F3B-1. The engine remained the venerable Pratt & Whitney R-1340B Wasp radial, now rated at 450 hp. Armament also remained the same as that found on previous types, either a pair of .30 caliber machine guns or one .30 and one .50 caliber machine gun synchronized to fire through the propeller arc.

The wing was also an entirely new design. The new wing employed both a straight leading and trailing edge, compared to the tapered wing found on the F3B-1. Wingtips were rounded and the wings had the exaggerated stagger as found on the F3B-1. Wing construction was similar to previous variants with two box spars and routed out mahogany bracing. Both wings were fabric-covered with corrugated aluminum ailerons. The span was only thirty feet, three feet shorter than the F3B-1.

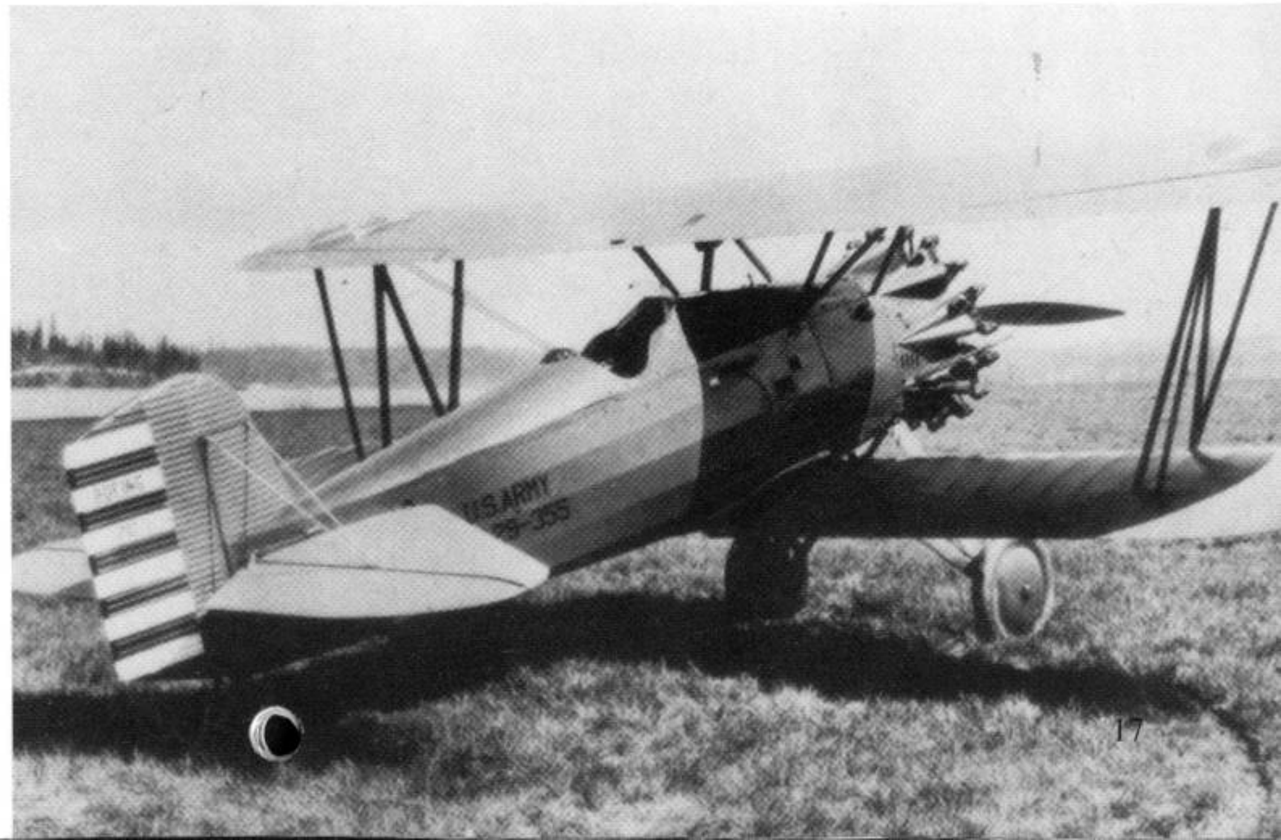
Boeing built two prototypes at their own expense, the Model 83 and Model 89. Each was both the same and different from the other to meet different requirements of the two competing services. The Model 83 had a spreader-bar landing gear arrangement and was equipped with an arrestor hook for aircraft carrier landings. The Model 89 used a standard Boeing split-axle landing gear and could carry a 500 pound bomb under the fuselage. Both aircraft had provisions to carry a 55 gallon auxiliary fuel tank between the landing gear legs and both had provision for carrying bombs under the wings. Strangely, although Boeing was aiming the series at both services requirements, both the Model 83 and 89 were initially tested only by the Navy. The Model 83 took to the air for the first time on 25 June 1928 and was then sent to North Island Naval Air Station in San Diego for evaluation. The Model 89 was shipped by train to NAS Anacostia near Washington, DC, making its first flight there on 7 August 1928. Although not Navy property (yet), both aircraft were already being referred to as XF4B-1s. Impressed by the initial test results and enthusiastic pilot claims, the Navy ordered full scale evaluation trials for both XF4B-1s.

The Army got their first look at the new Boeing fighter during the Navy tests at Anacostia. Army brass sent some pilots from Bolling Field to Anacostia to watch the Navy tests and shake down the Model 89 as time permitted. Again the pilots claims were very enthusiastic and the Army ordered twelve of the diminutive Boeing fighters on 7 November 1928, designating the new aircraft as the P-12. The only difference between the P-12 and the XF4B-1 was deletion of the Navy-required equipment such as the carrier arresting gear. Both the production versions of the XF4B-1 and the P-12 had fairings behind each cylinder head in an attempt to streamline the engine shape.

Full scale tests by the Navy revealed many minor problems that pilots noted for change. There were the usual fuel and oil leaks, and the XF4B-1 suffered from a bad engine which was quickly replaced. The Navy opted for the split-axle landing gear arrangement which had

The Boeing Model 89 was the prototype for the F4B/P-12 series. Two prototypes were built, the Model 89 (F4B) had a split-axle landing gear and carrier arresting gear, while the Model 83 (P-12) had a spreader-bar axle. The prototype's first flight came on 7 August 1928. (Warren Bodie)

The Army version of the Model 89 was designated P-12 and made its first flight on 11 April 1929. The P-12 was identical to production Navy F4B-1s with the arresting gear and other naval equipment removed. Army color scheme was Olive Drab with Yellow wings and tail surfaces. (AFM)



to be changed on one of the prototypes. With its short stubby fuselage and narrow-track landing gear, the XF4B-1 was very hard to steer on the ground. Pilots ground-looped the prototypes often, some of which caused severe damage to the lower wingtips. But all the problems aside, the Navy Evaluation Board highly recommended the XF4B-1 for production. On 28 November 1928, Navy ordered twenty-seven F4B-1s from Boeing, plus a complete rework of both prototype aircraft to bring them up to production standard. The first production F4B-1 went into service with VF-1B aboard USS LEXINGTON on 8 August 1929.

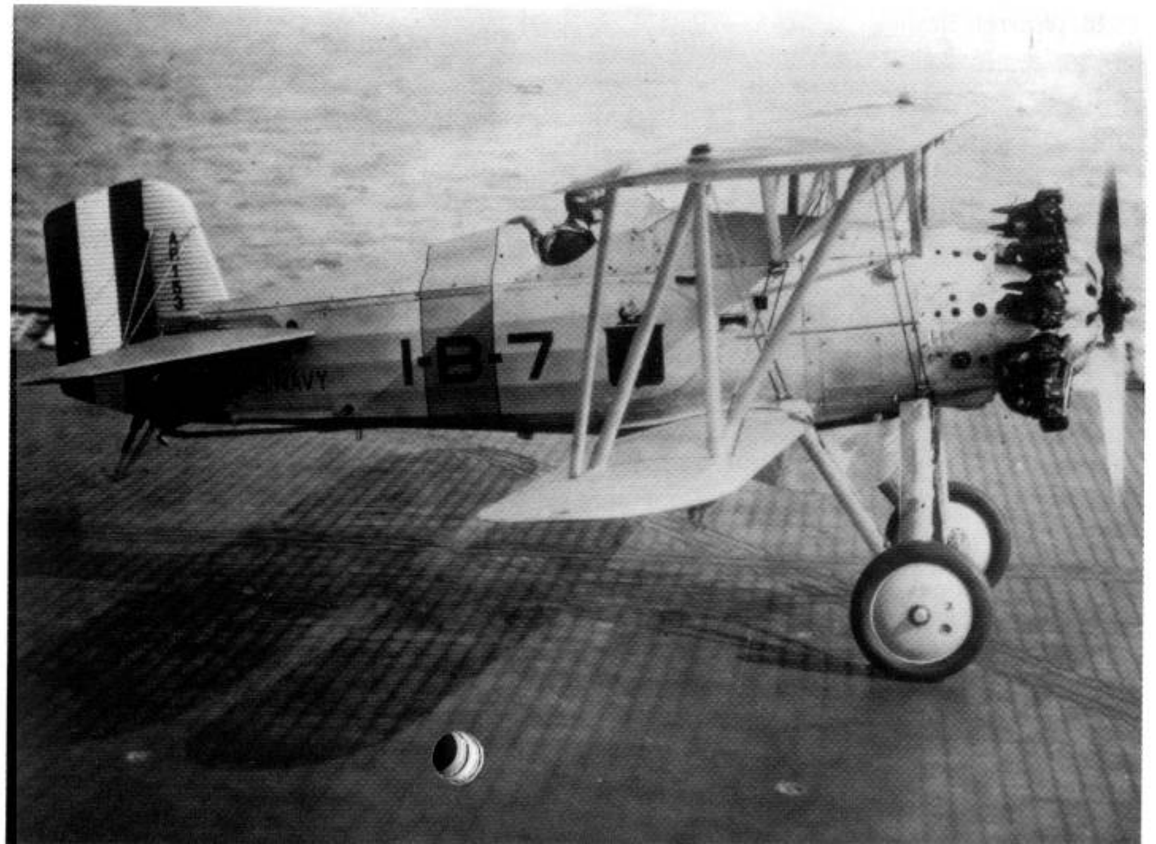
The first Army P-12 (29-353) was completed early in 1929. CAPT Ira Eaker accepted the P-12 for Army service in late February. This first P-12 was to be a flying advertisement for both the Army Air Corps and the Boeing fighter. Sporting a special paint job of a Gloss Black fuselage, Red tail and wheels, with Cream-colored wings, Eaker left Boeing Field in the P-12 on 27 February 1929. His destination, France Field, Panama Canal Zone. On 17 March, having battled bad weather all along the way, Eaker buzzed the France Field troops standing by their PW-9s and landed. The next morning he began the return flight. It was a very auspicious beginning and a hell of a way to break in a brand new aircraft. Production P-12s entered service with the 95th Pursuit Squadron at Rockwell Field, California in April of 1929.

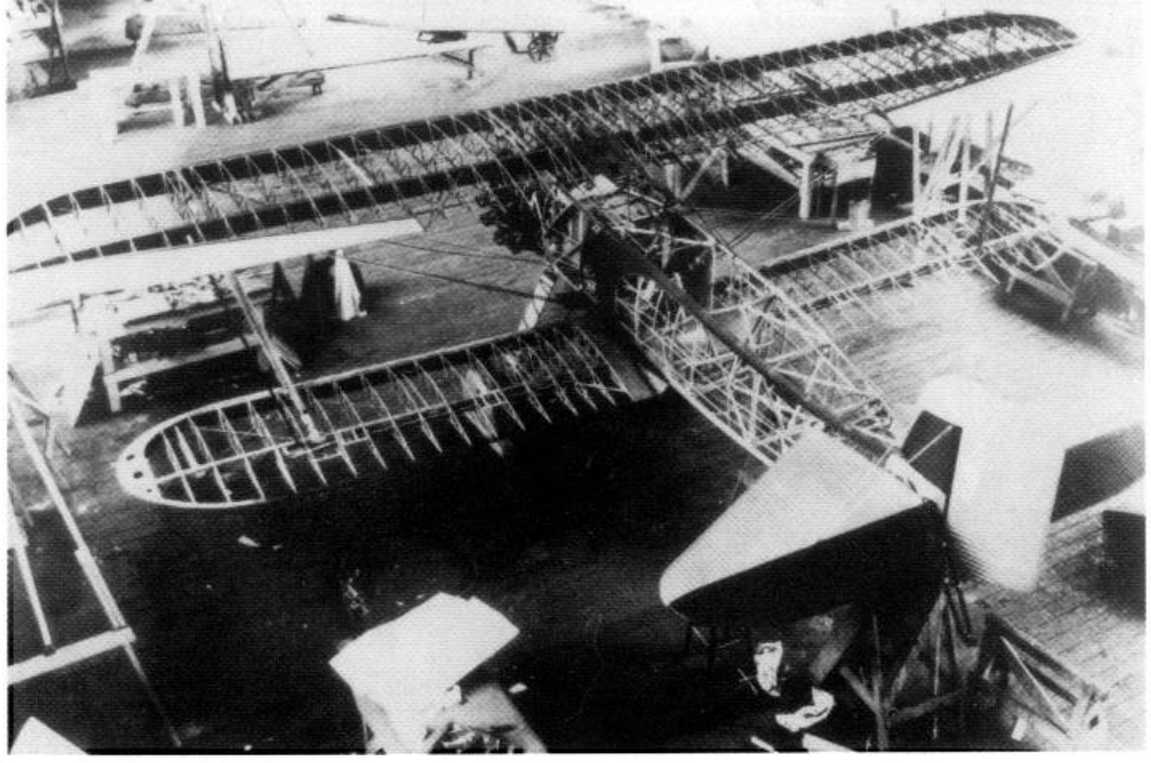
The last aircraft (29-362) on the initial Army production run was modified by the addition of Frise ailerons, a shorter landing gear, castoring tail skid, and a full engine cowling and designated XP-12A. Before full tests were completed, the XP-12A was destroyed in a mid-air collision on 18 May 1929. One of the Navy F4B-1s was also tested with an engine cowl ring and designated F4B-1A. The ultimate in P-12/F4B designs was beginning to take shape. The sole F4B-1A was then modified without armament, painted a Gloss Navy Blue, and was used by Assistant Secretary of the Navy David Ingalls as his personal aircraft.

Army CAPT Ira Eaker stands next to the first Army P-12 (29-353) at Boeing Field on 26 February 1929. The aircraft was named "Pan American" and carried a special Gloss Black and Cream paint scheme for a goodwill flight that Eaker made to Central America. (AFM)

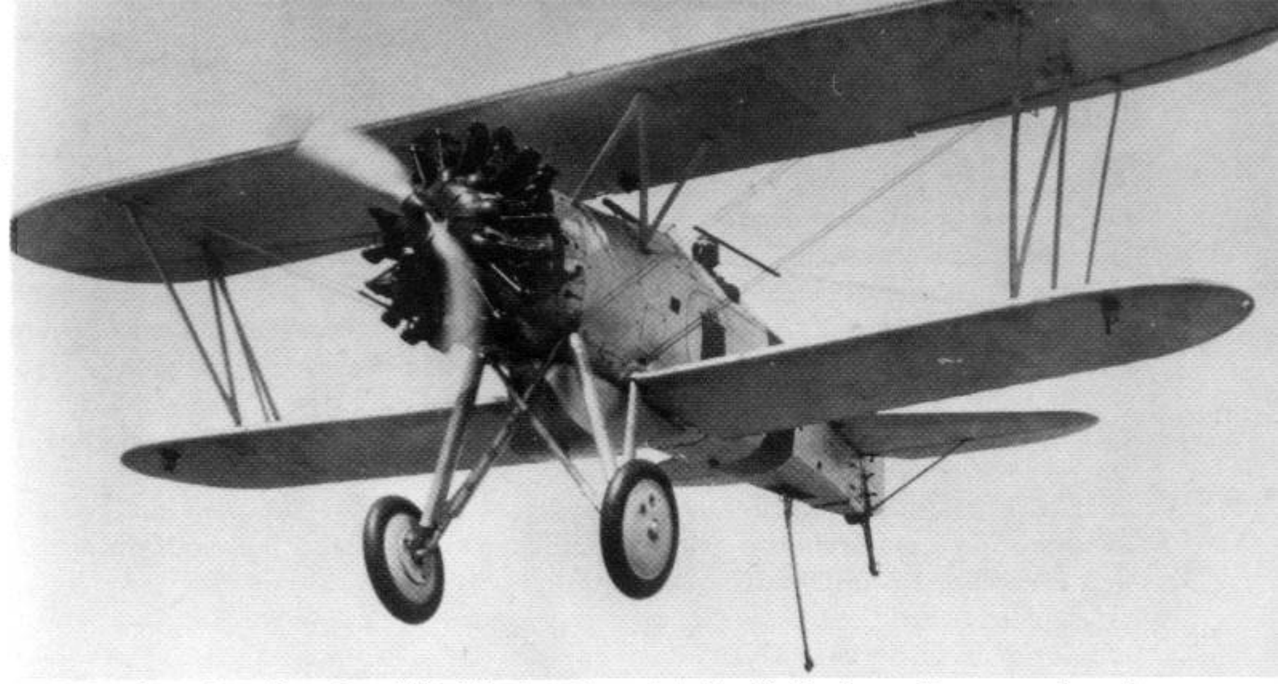
A production Navy F4B-1 of Fighting Five (VF-5) Red Rippers aboard USS LEXINGTON. F4B-1s could carry a 55 gallon dropable fuel tank under the fuselage to extend the aircraft's range. The first production F4B-1 made its first flight on 6 May 1929. (Warren Bodie)

An F4B-1 of Bombing One Red Rippers aboard USS LEXINGTON. There can be some confusion when trying to make Navy squadron identifications, since units changed missions and designations often. This aircraft has had the cylinder head fairings removed to improve engine cooling. (Jeff Ethell)





An Army P-12 under construction at the Boeing plant in 1929. The tapered ailerons were used only on P-12/F4B-1 aircraft and the fuselage frame was bolted aluminum tubing, with corrugated aluminum control surfaces. (Peter Bowers)



An F4B-1 from Bombing One (VB-1B) about to catch the first wire as it comes aboard USS LEXINGTON in 1929. The F4B-1 had a reinforced fuselage frame and landing gear to enable it to absorb the punishment of deck landings. (Jeff Ethell)

A lineup of 95th Pursuit Squadron P-12s at March Field, California, during 1929. The nearest aircraft is CAPT Eaker's "Pan American," now assigned to MAJ Carl "Tooey" Spaatz, commander of the 7th Bomb Group. This unusual P-12 retained its Black/Cream non-standard paint scheme throughout its service life. (Bob Esposito)

P-12B

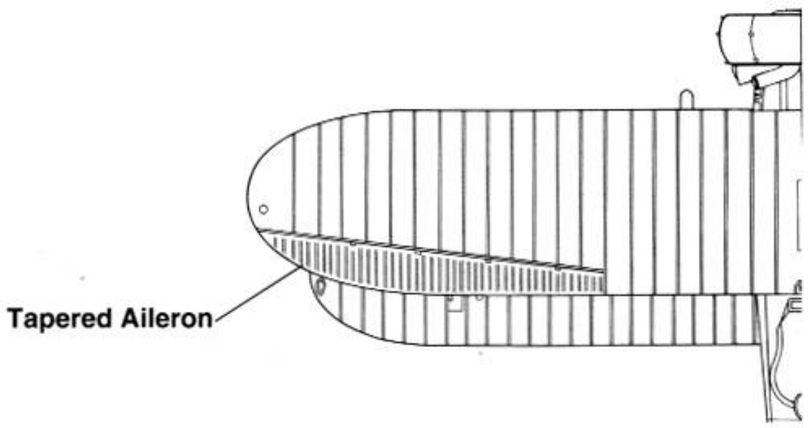
The P-12B was the production equivalent of the XP-12A. It incorporated both the Frise ailerons and the redesigned elevators of the XP-12A. The engine; however, remained uncowled and the cylinder head fairings found on the P-12 and F4B-1 were deleted to improve cylinder head cooling. The P-12B had larger wheels and tires but still retained the split-axle Vee-style landing gear as used on previous models. The power plant remained the Pratt & Whitney R-1340-7 Wasp radial rated at 450 hp On 10 June 1929, following the successful testing of both the P-12 and the XP-12A, the Army gave Boeing the go-ahead on production of the P-12B. The initial order was for ninety P-12Bs. The first flight of the P-12 took place on 30 May 1930, and the aircraft were introduced into service soon after. Later in their service life, the P-12Bs had both the engine cowl ring and the larger vertical tail surfaces from the P-12E retrofitted to all aircraft remaining in the inventory. Some of the remaining early F4Bs were also fitted with F4B-4 vertical tall surfaces.

(Right) These P-12Bs were from the 55th Pursuit Squadron at Mather Field, California during 1934. The 55th PS emblem was a Yellow swastika-like Indian emblem on a Red disc. The nearest aircraft, #1, is the 55th PS Commander's aircraft as denoted by the three White bands on the upper wing surface. (AFM)

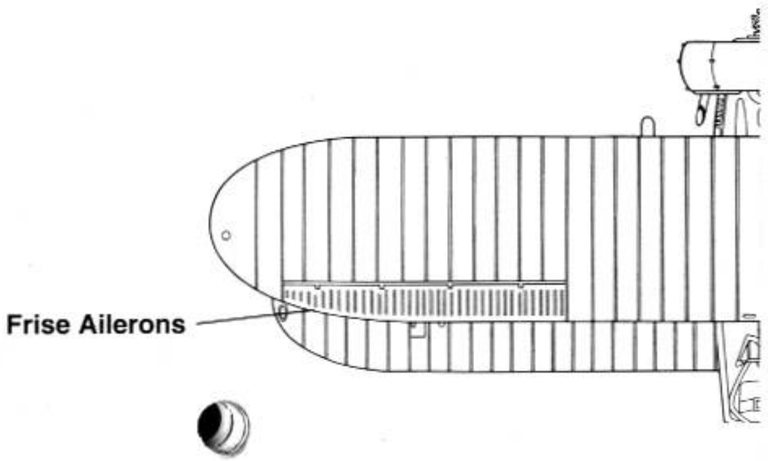
CAPT Nathan Twining flew this P-12B. The aircraft carried the service, manufacturer, type and serial number on the fuselage in White along with the pilot's name and rank under in White under the cockpit. This P-12B was very strange since it had a P-12 upper wing with tapered ailerons, but carries a P-12C serial (31-170). (AFM)

Aileron Development

P-12A



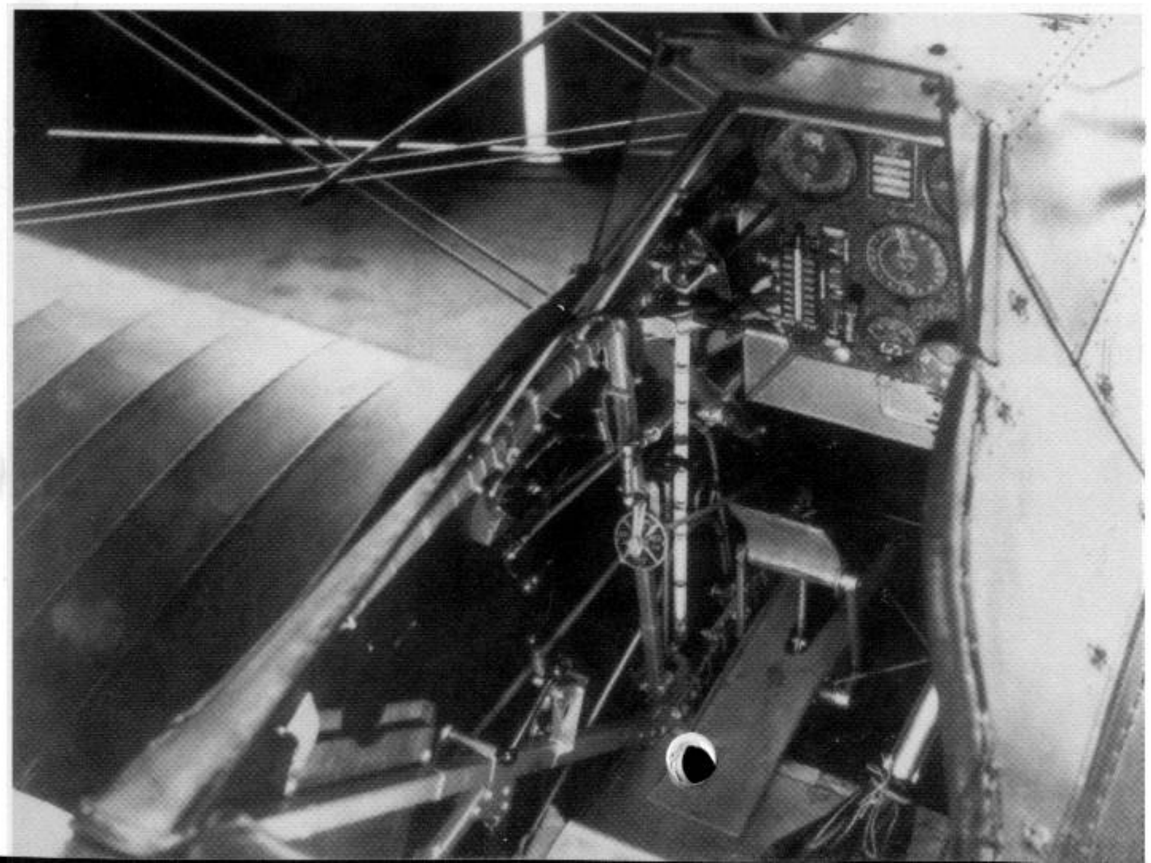
P-12B



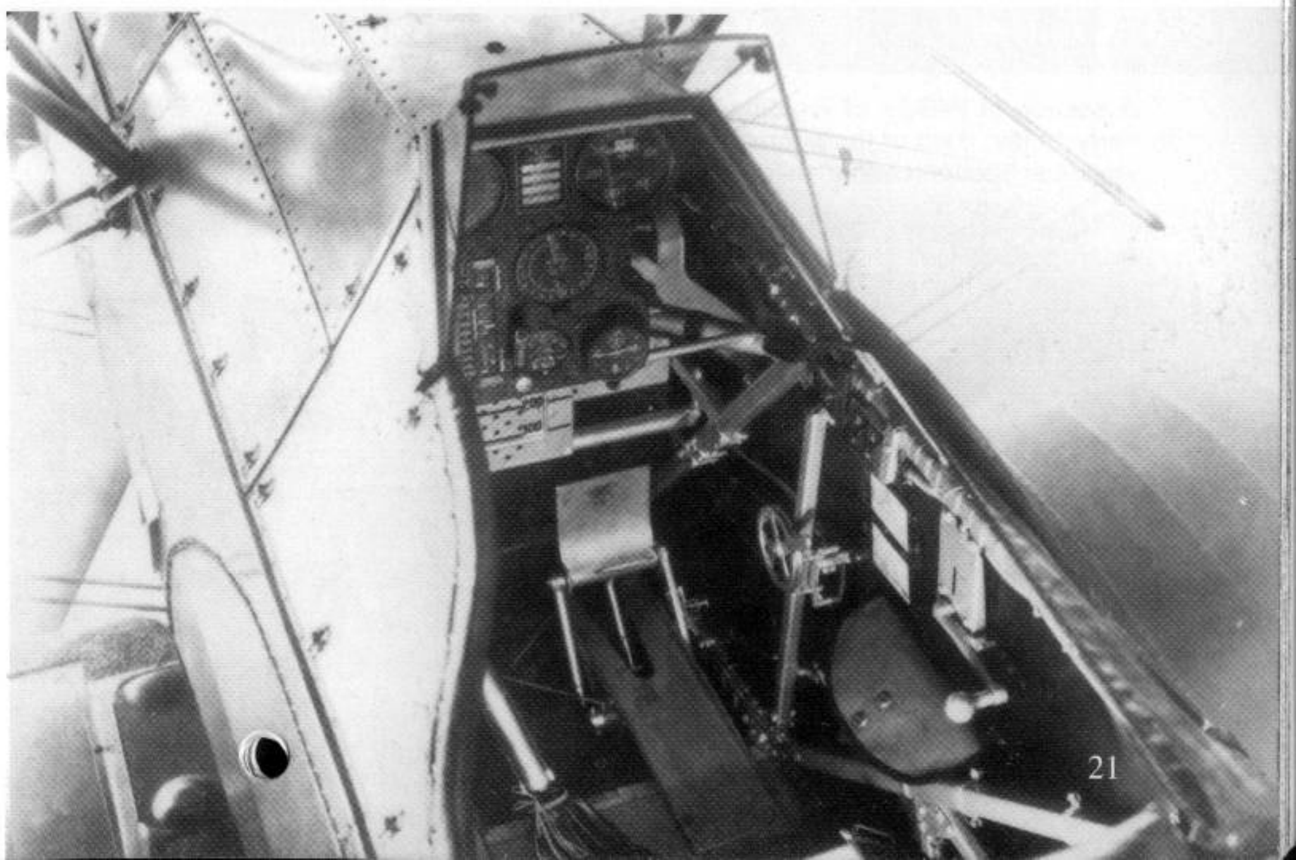
This P-12B was assigned to the Bolling Field Detachment of the Army Headquarters Command. The Capitol Building emblem was later assigned to the 14th Pursuit Squadron which was also based at Bolling Field, just outside of Washington D.C. (AFM)

The 94th Pursuit Squadron stunt team stands by one of their P-12Bs at Selfridge Field, Michigan. The reliable power of the Pratt & Whitney Wasp radial, combined with the light wing loading of the P-12 design, made the aircraft a superb dog-fighter and stunt aircraft. The bar on top of the wing is a gun camera mounting. (AFM)

The P-12/F4B-1 cockpit was Spartan but well laid out. The left side of the cockpit has the throttle quadrant and fuel tank selector switch mounted on the cockpit wall. The box next to the pilot's seat is a metal map case. Some of the visible instruments include the tachometer, clock, altimeter and some of the engine instruments. (AFM)



The pouch on the right cockpit wall was for the aircraft's documents and logbooks. Visible on the Black instrument panel are the altimeter, air speed indicator, clock and various engine instruments. The curved metal plate just under the instrument panel is the starboard rudder pedal. (AFM)

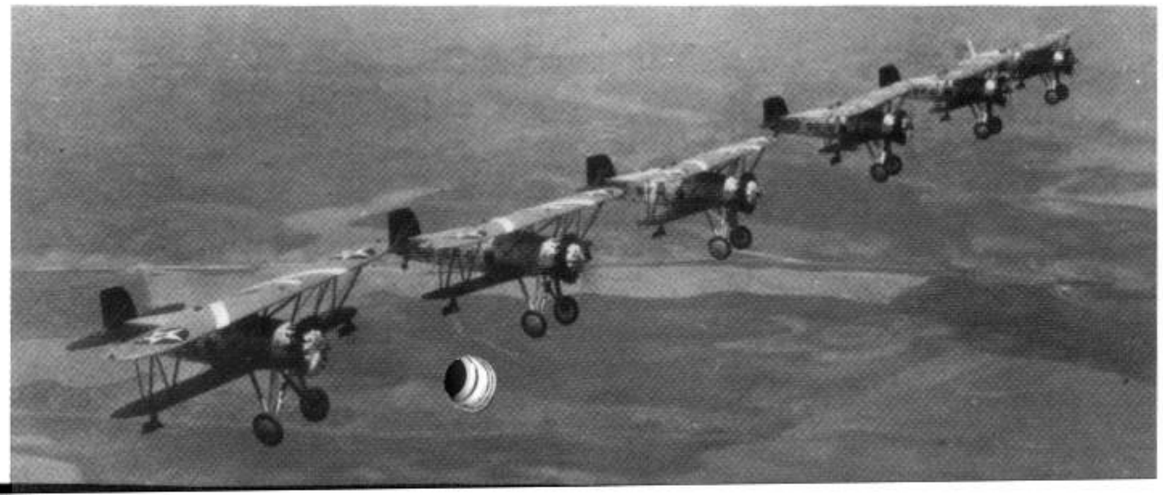


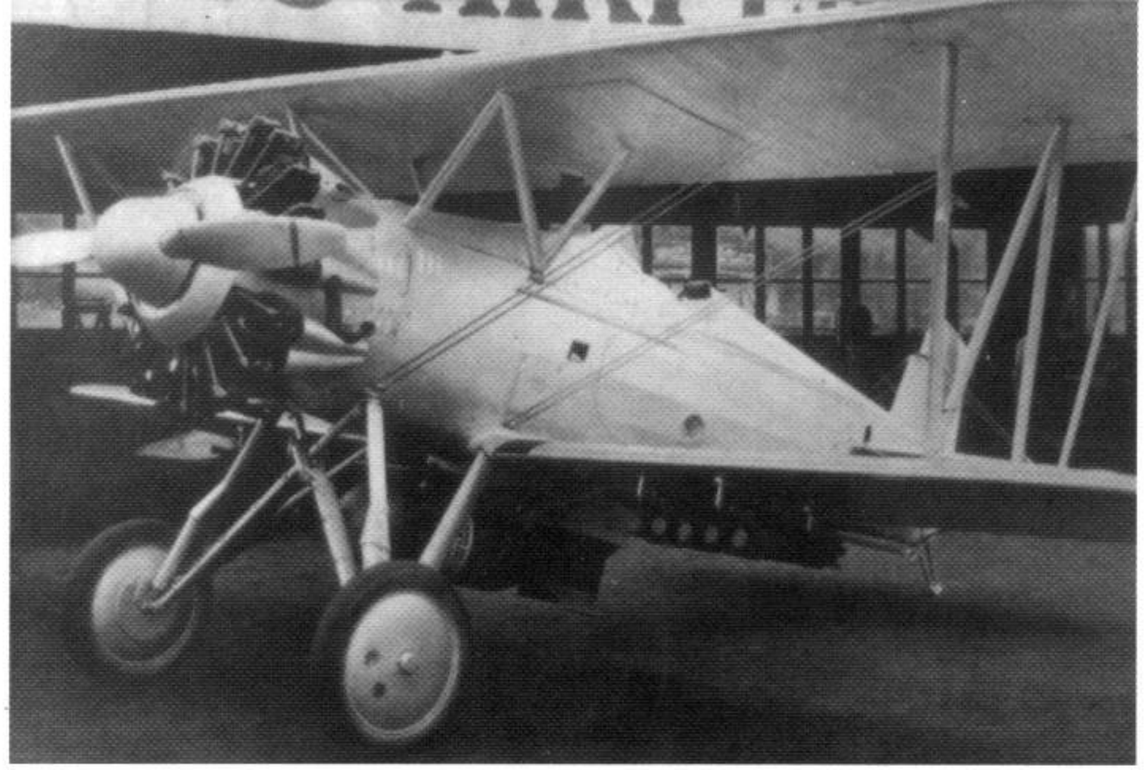
A section of F4B-1s of Fighting Five stationed aboard the USS LEXINGTON during the early 1930s. Two of the aircraft have the True Blue tail markings of LEXINGTON aircraft, while the Section Leader's aircraft was unpainted. (Jeff Ethell)

This F4B-1 was assigned to the Navy Detachment at NAS Anacostia, just outside of Washington, D.C. It was the personal aircraft of Assistant Secretary of the Navy Douglas Ingalls. Anacostia aircraft were overall Gloss Silver with Chrome Yellow upper wing surfaces. (Bob Esposito)

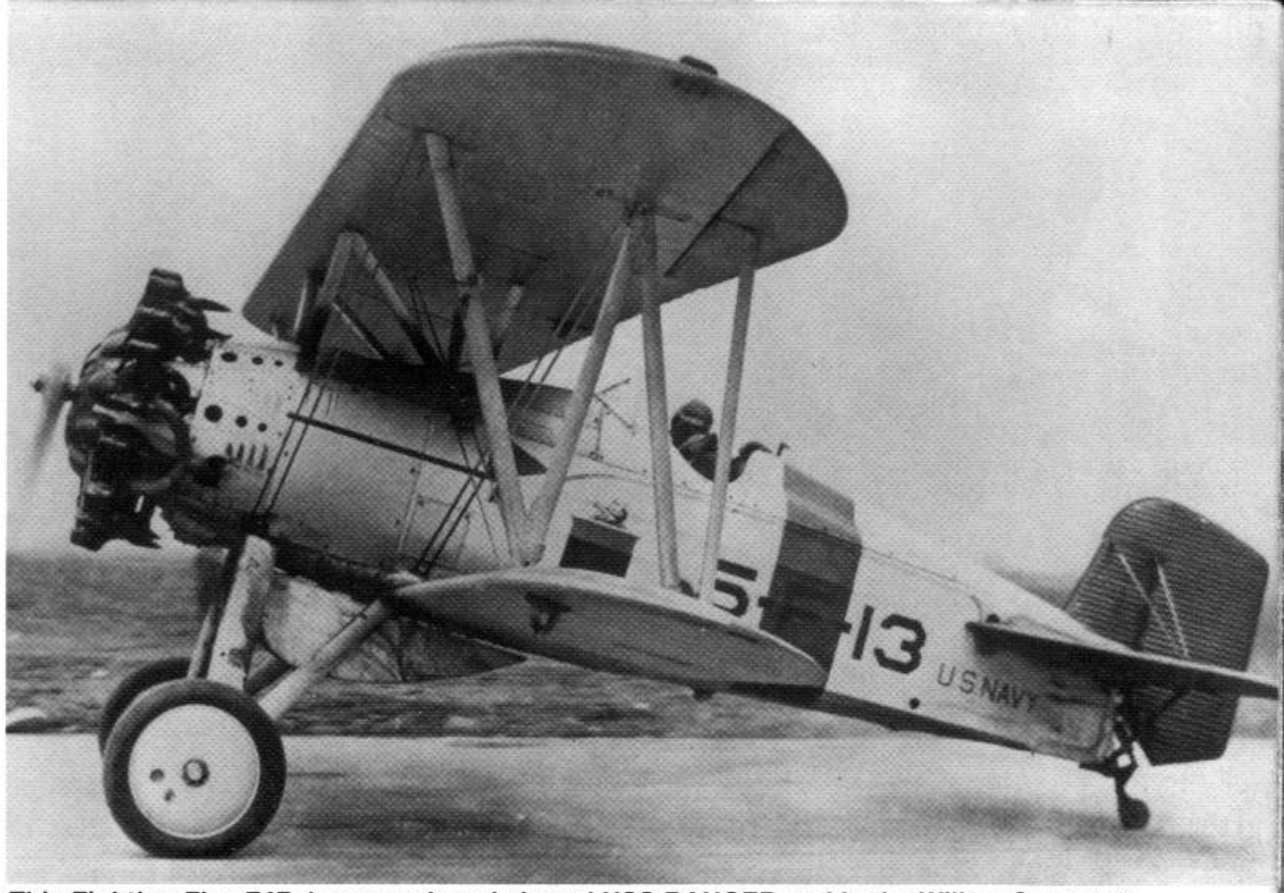
NAVAL Aviation School

Two flights of F4B-1s from Fighting and Bombing Five Red Rippers in flight near their home base of NAS North Island, California during 1930. VF-5B was stationed aboard USS SARATOGA at the time and carried a Red tail. Earlier the squadron had been assigned to USS LEXINGTON as VF-5S and VB-1 with Blue tails. (USN via Bob Lawson)



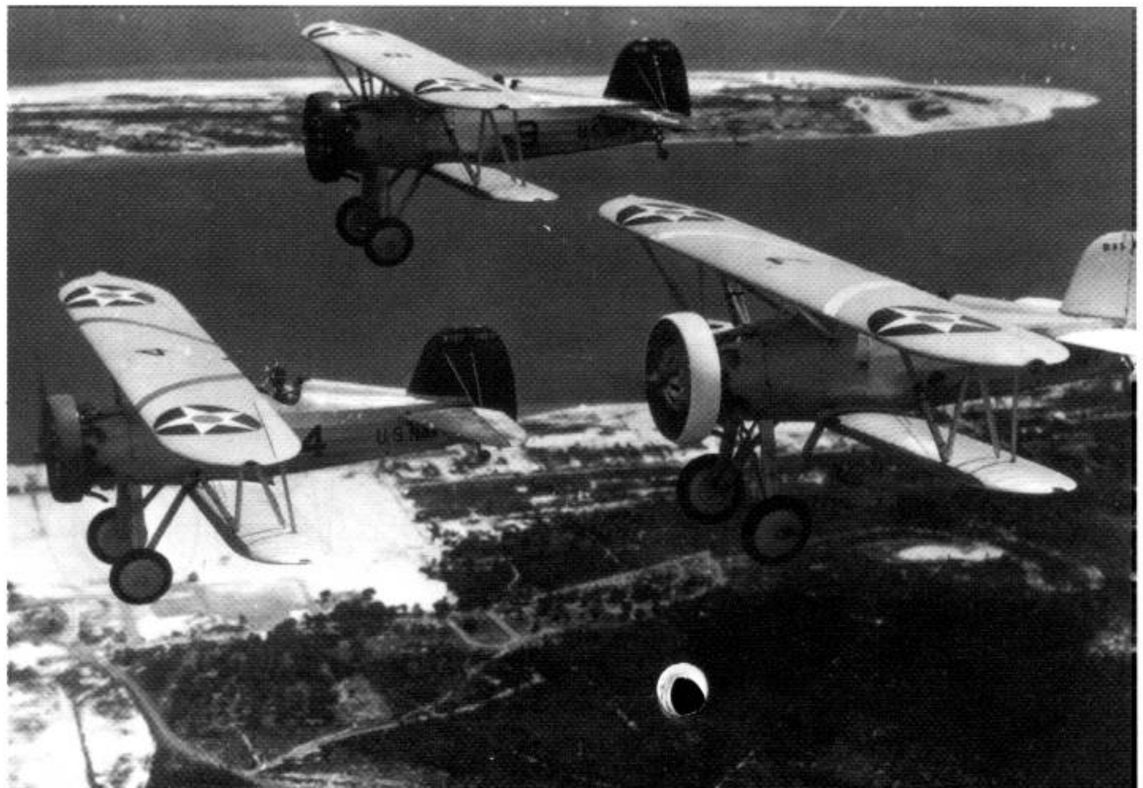


The Model 89 (F4B-1) was capable of carrying one 500 pound bomb under the fuselage and ten 25 pound bombs, five under each wing. The aircraft was fitted with a cold weather engine crankcase cover and the cylinder heads are faired in an attempt to reduce drag. (Boeing)

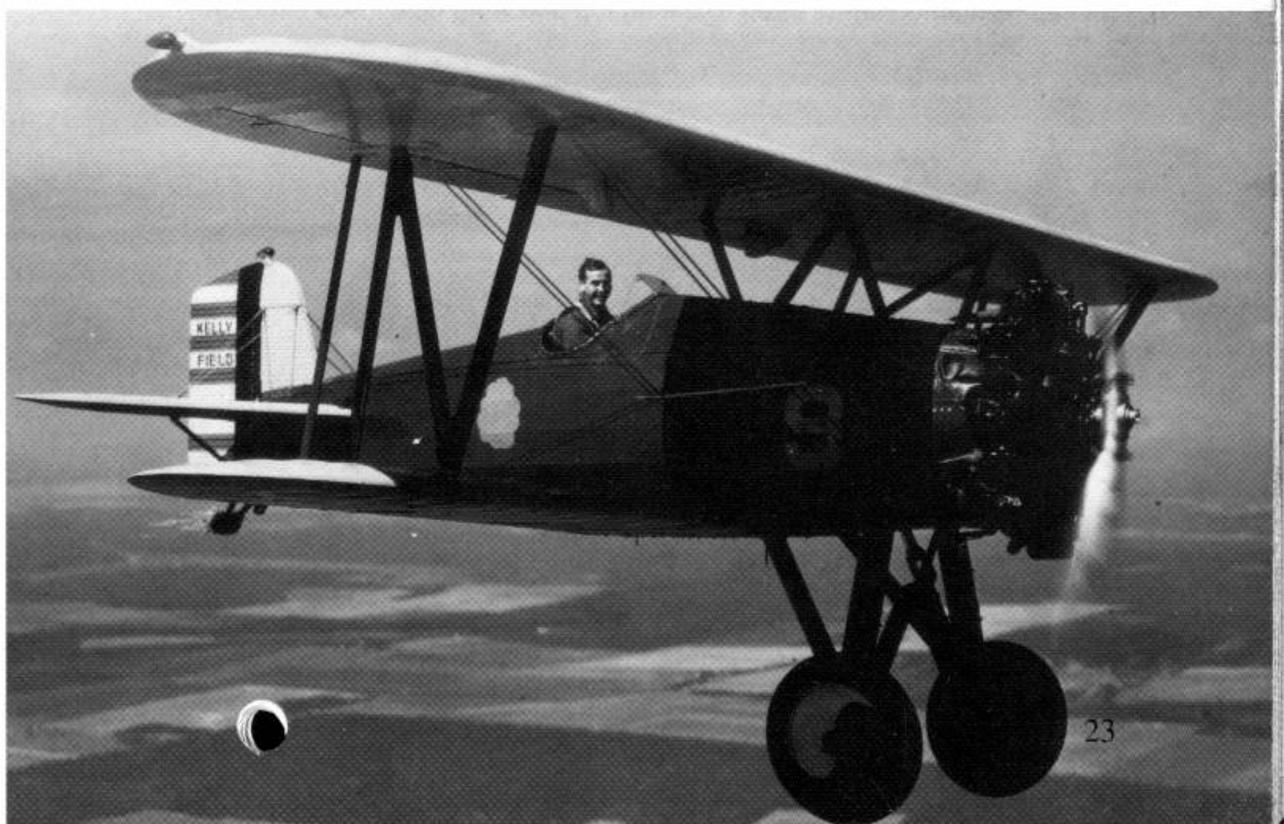


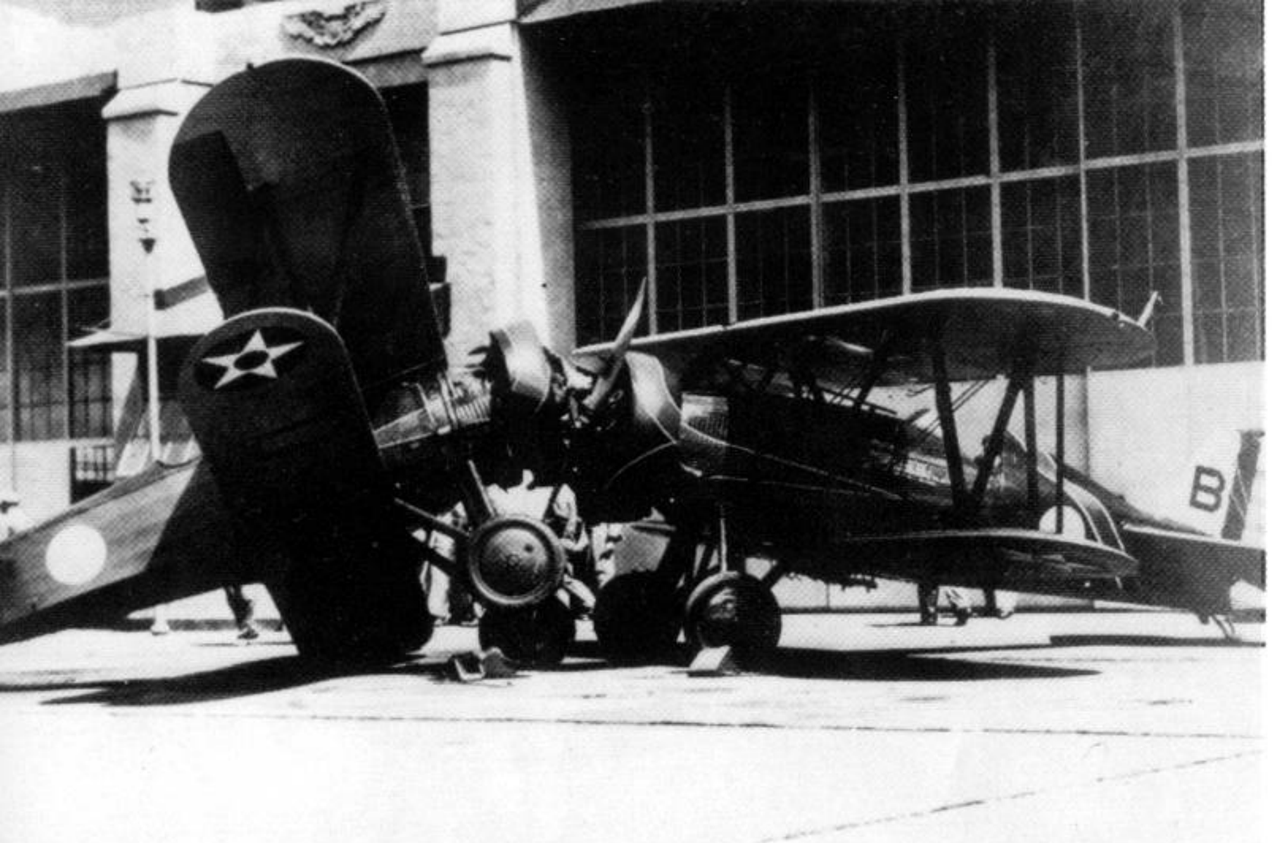
This Fighting Five F4B-1 was assigned aboard USS RANGER and had a Willow Green tail assembly. There are cooling holes in the engine cowl where the cylinder head fairings were formerly fitted. The stains on the auxiliary fuel tank was caused by fuel leak, which were common with these tanks. (Jeff Ethell)

A trio of F4B-Is assigned to the Naval Aviation School at Naval Air Station Pensacola, Florida. All three aircraft have had Townend cowl rings and F4B-4 vertical tail surfaces retrofitted during overhaul. Each aircraft was painted in the colors of different school sections. (Warren Bodie)



This P-12B is assigned to the 43rd School Squadron at Kelly Field, Texas during 1932. The pristine Olive Drab and Yellow paint scheme is indicative of the pride at Kelly Field. The aircraft was fitted with navigational lights on the wingtips and tail. (Robert F. Dorr)

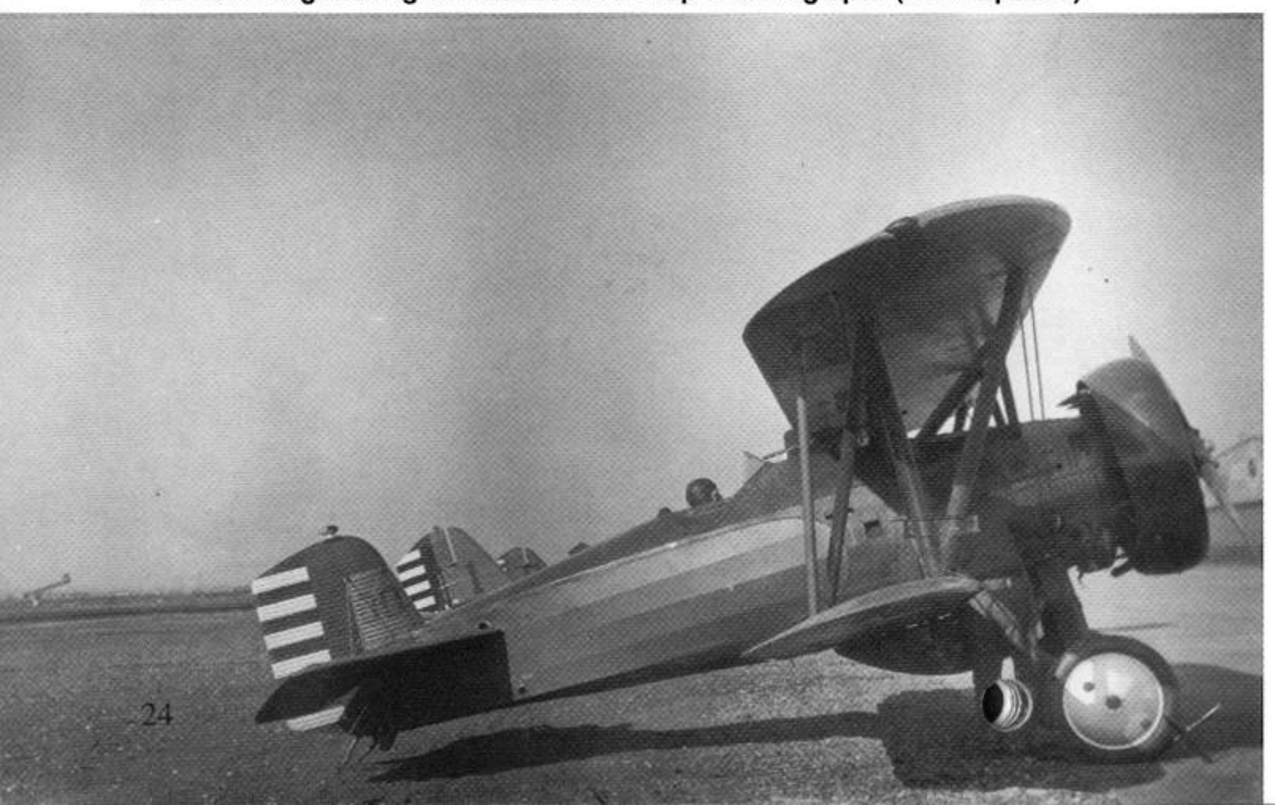




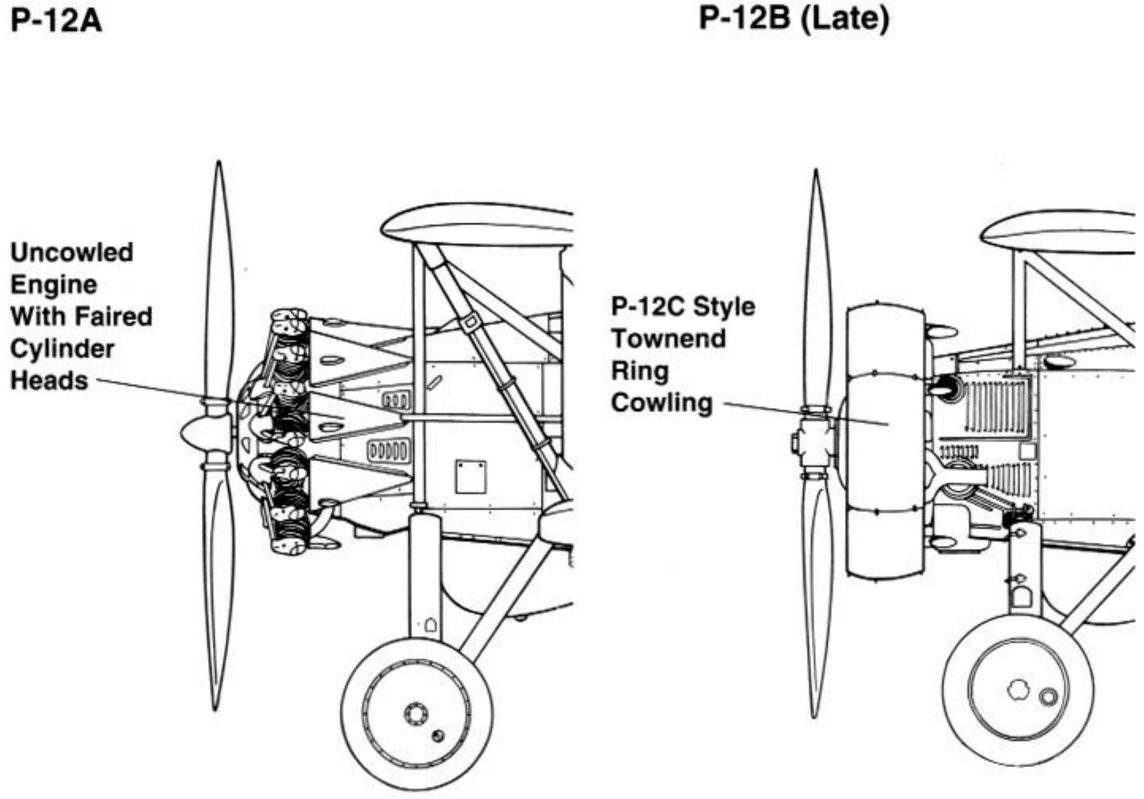
This 6th Pursuit Squadron P-12B was moved by high winds and slammed into the 6th Pursuit Squadron commander's new P-12E outside the main hangar at Wheeler Field, Hawaii during July of 1934. (AFM)

This P-12B was assigned to the Chanute Field Flying School during 1931. The Townend cowl ring and individual exhaust stacks were retrofitted to all remaining P-12/P-12Bs in service. Later, the individual exhaust stacks were changed to an exhaust collector ring. (AFM)

As with their Navy cousins, Army P-12s and P-12Bs had Townend cowl rings, individual exhaust stacks, and other later variant features retrofitted during overhauls. This aircraft has had navigation lights fitted to the fin top and wing tips. (Bob Esposito)

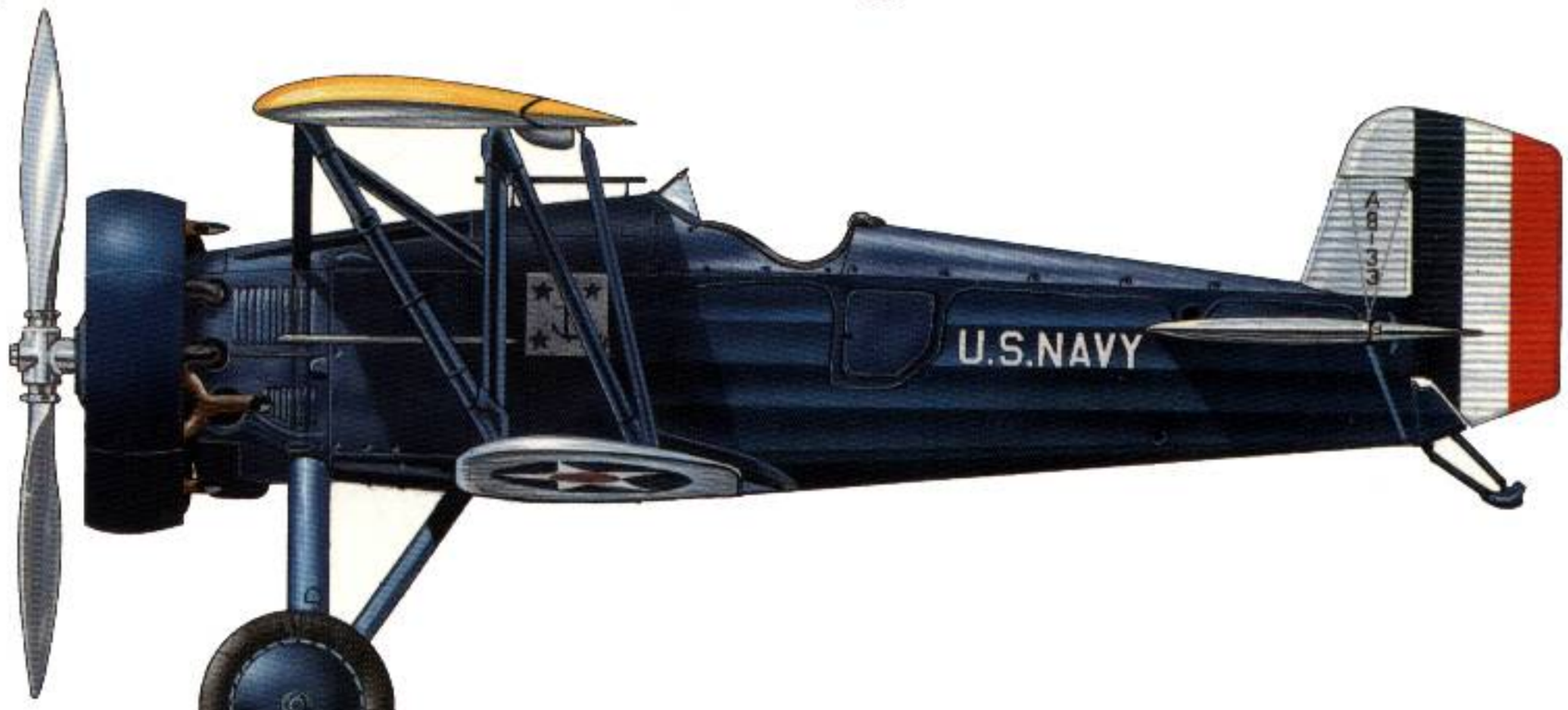


Engine Cowling



An FB-5 of Fighting and Bombing Three (VFB-3) aboard USS LANGLEY during August of 1928.

This Boeing P-12, flown by CAPT Ira Eaker on a public relations flight to Panama during February of 1929, carried the name PAN AMERICAN on the fuselage in Red.



This F4B-1A was flown by Douglas Ingalls when he was Assistant Secretary of the Navy in 1930.

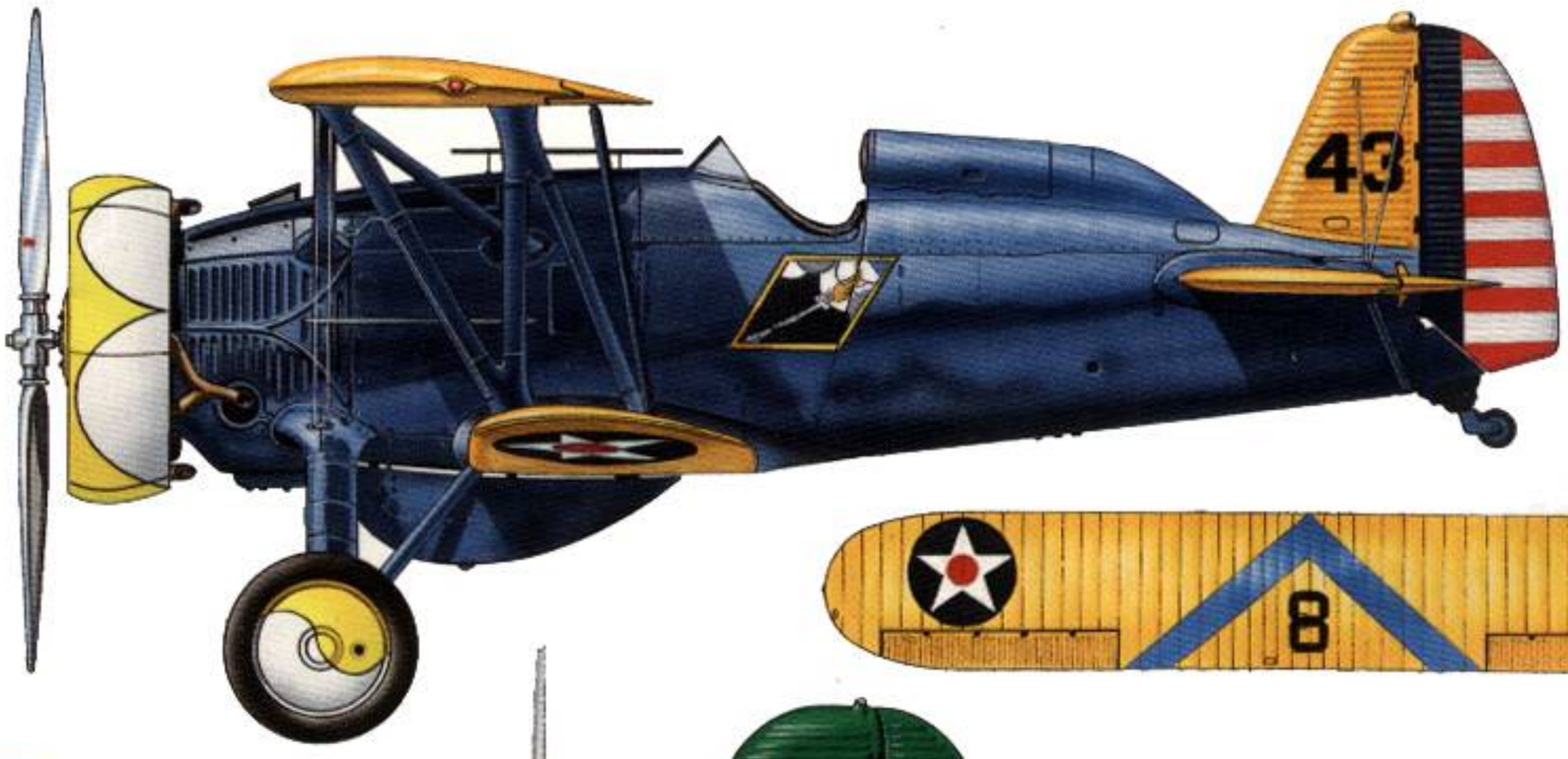
This P-12C was assigned to the U.S. Army Command and Staff School at Chanute Field in 1934.

An F4B-3 from Headquarters, U.S. Marine Corps in Anacostia, Virginia. The aircaft was used for air show demonstrations during 1935.

This P-12E of the 95th Pursuit Squadron was one of the many Army aircraft that delivered Air Mail during the Air Mail crisis of 1934.

An F4B-3 from Fighting and Bombing One (VFB-1) aboard USS SARATOGA during 1932.

A P-12E from the 79th Pursuit Squadron based at Barksdale Field, Louisiana in May of 1935.



An F4B-4 from Bombing Five (VB-5) aboard USS LEXINGTON during 1934.

This overall Silver doped P-12E was flown by B Flight Leader of the 308th Observation Squadron, Organized Reserve during 1939.

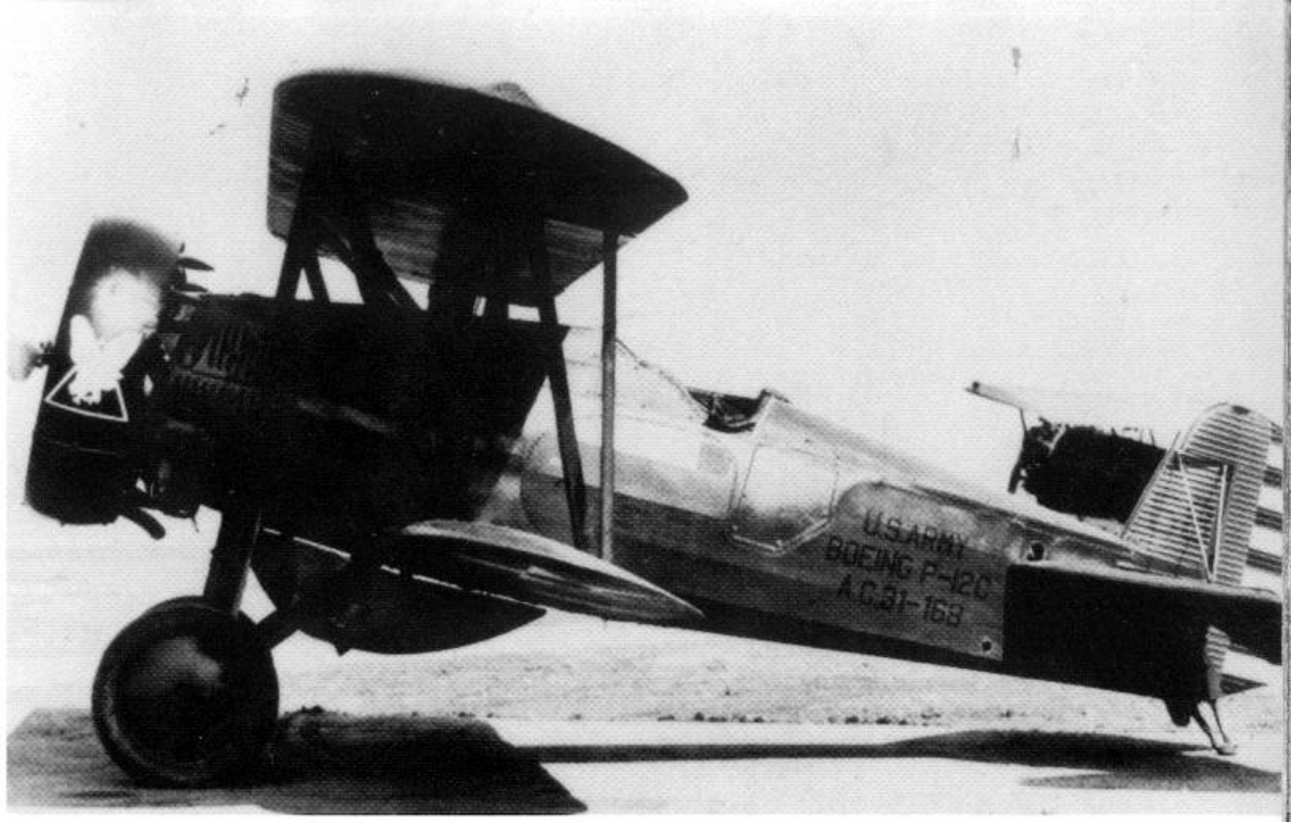
P-12C

The P-12C was the first of the P-12 series to incorporate the Townend engine cowl ring on production aircraft. The P-12C also had the cross-axle, spreader-bar landing gear arrangement found on the Model 83 prototype. Navigation lights were added to the wingtips for night formation flying. Power came from the improved Pratt & Whitney R-1340-9 engine, which was still rated at only 450 hp but now offering that power at altitudes up to 8,000 feet. Army ordered one hundred thirty six P-12Cs on 2 June 1930, but only completed ninety-six as actual P-12Cs. The first flight for the P-12C came on 30 January 1931.

F4B-2

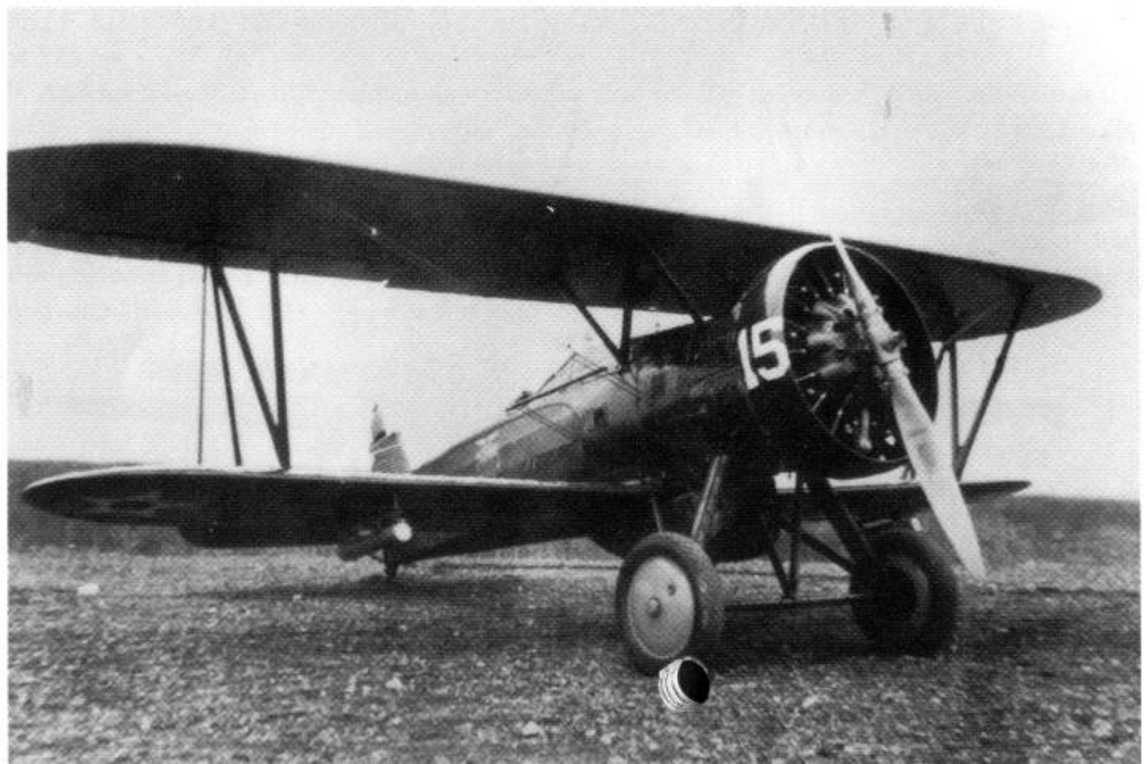
The F4B-2 was the Navy equivalent to the P-12C. It had the Frise ailerons on the upper wing, incorporated the cowling ring around the cylinder heads, and had both the cross axle landing gear and re-designed elevators found on the Army variants. The F4B-2 was the first variant to have a tail wheel assembly in place of the tall skids found on all Army variants. The F4B-2 was equipped with an arrestor hook and had the rear fuselage reinforced for aircraft carrier landings. The engine was the Pratt & Whitney R-1340-8 rated at 500 hp.

The Navy ordered forty-six F4B-2s, with deliveries commencing on 2 January 1931. The first unit operational in the F4B-2 was VF-5B aboard USS Lexington, with VF-6B on USS Saratoga being the second. Later in their service lives, the remaining F4B-2s were retrofitted with the much larger vertical tall surfaces as found on the F4B-4.



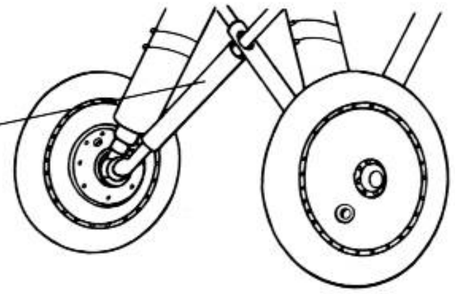
Although this P-12C carries the "Snow Owl" emblem of the 17th Pursuit Squadron at Selfridge Field, it bears little resemblance to the very colorful markings found on the Curtiss Hawks that it replaced. Boeing built some ninty-six P-12Cs. (Fred Dickey)

The P-12C was fitted with the Townend cowl ring during production and had the split-axle landing gear used on the P-12/P-12B replaced with a "spreader-bar" axle. The first flight of a production P-12C took place on 30 January 1931. (Jack Binder)

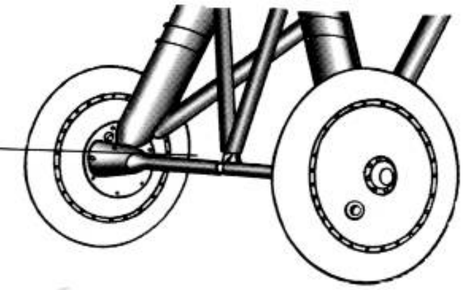


Landing Gear Development

P-12/P-12B

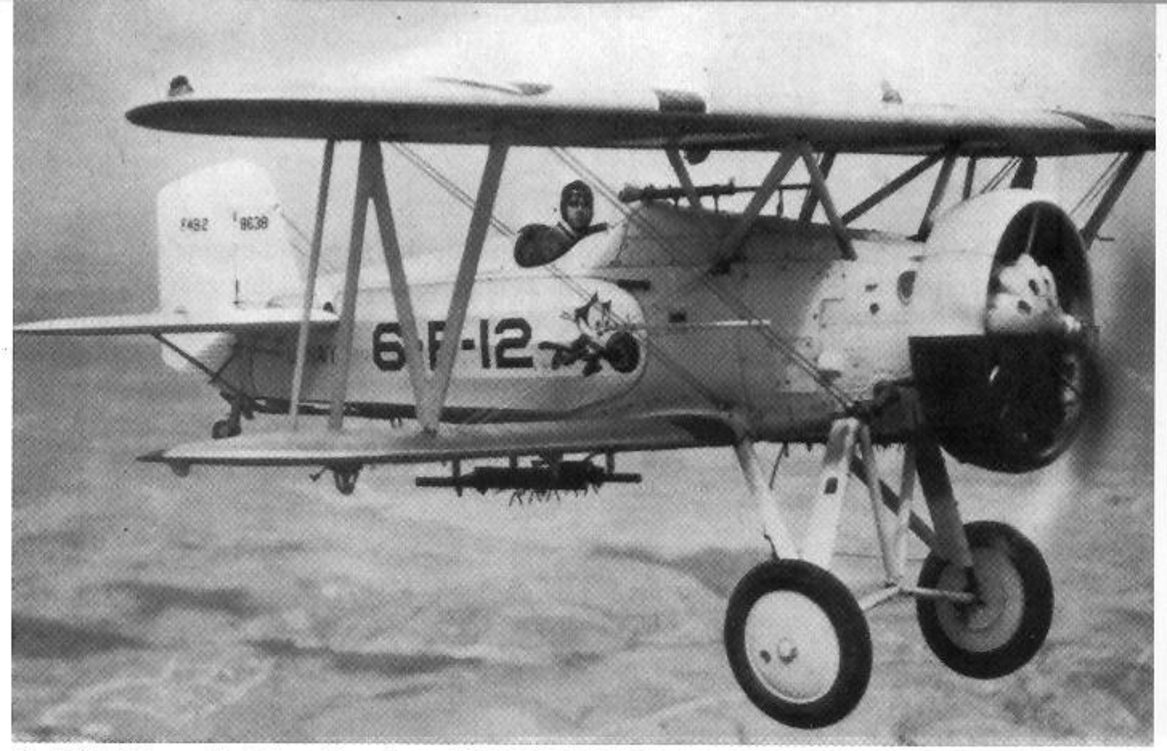


P-12C-P-12K



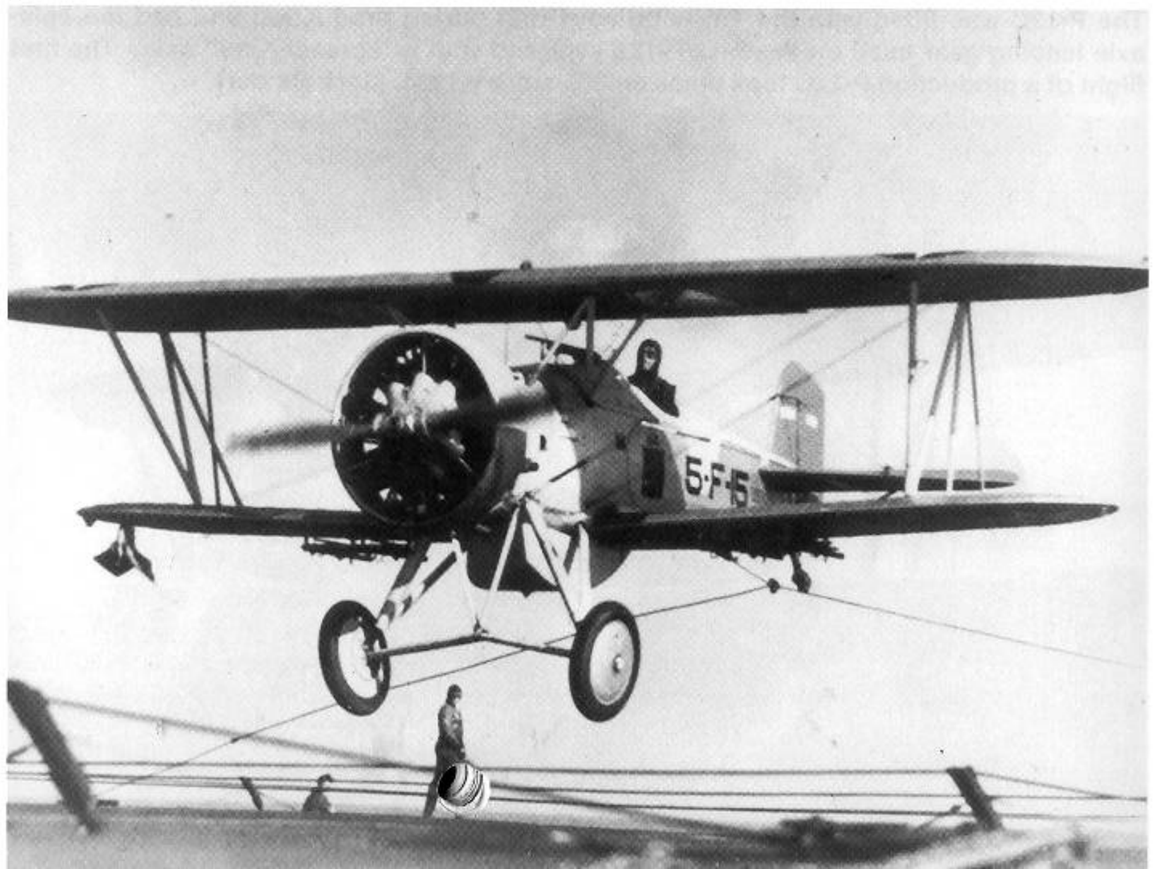
An F4B-2 from Fighting Five on USS LEXINGTON. The F4B-2 had a tail wheel as part of the carrier deck equipment added for Navy use, while the Army P-12Cs had a tail skid. The "E" on the fuselage is for Gunnery Excellence, while the small "M" was excellence in Maintenance. (Jeff Ethell)

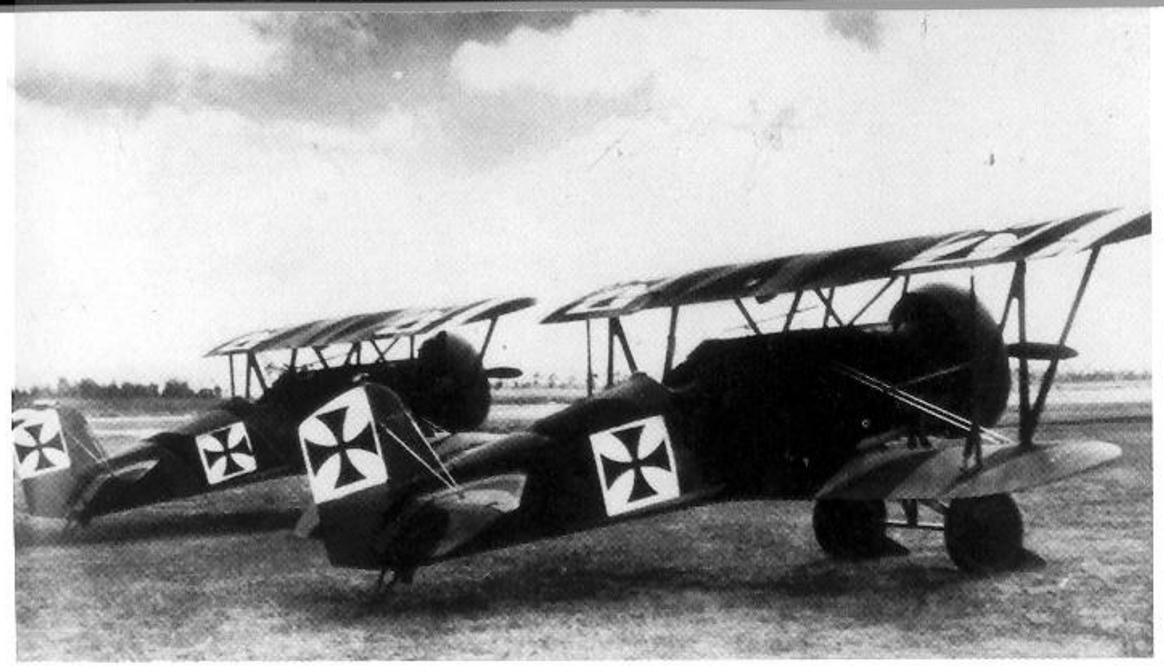
Mechanics prepare to replace the Pratt & Whitney radial on this 36th Pursuit Squadron P-12C at Big Bear, California in July of 1935. Although it looks far more complicated than the inline V-12 engines it replaced, the air-cooled radial engine was easier to maintain. This was the main reason it was adopted by Navy for its carrier aircraft. (AFM)



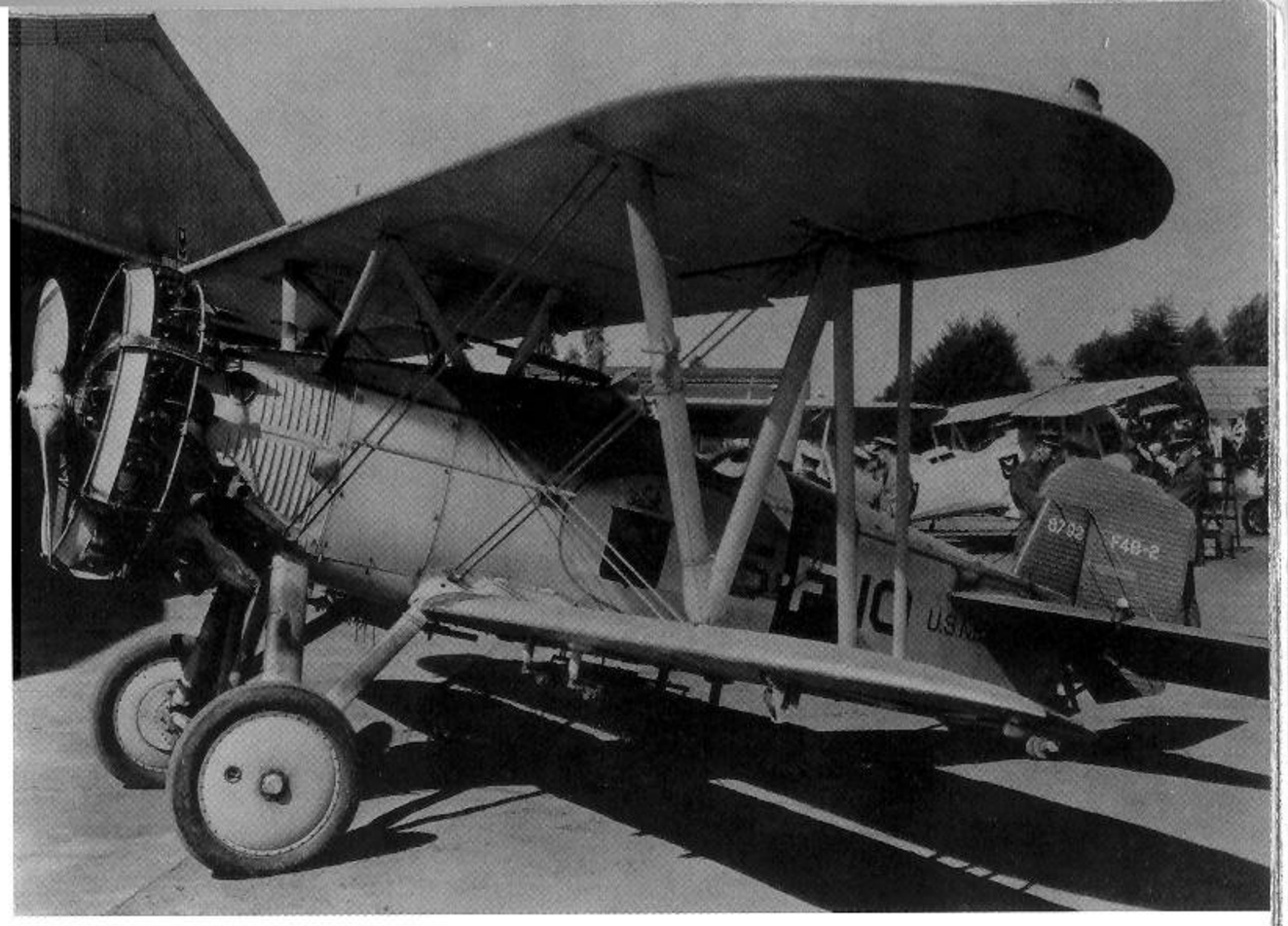
An F4B-2 from Fighting Six aboard USS SARATOGA. The F4B-2 was the Navy equivalent of the P-12C. All the metal parts of the F4B-2 were painted Gloss Gray at Boeing, rather than Silver as on the fabric areas. The underwing racks for bomb and flare carriage. (U. S. Navy)

This Fighting Five F4B-2 has just caught the number one wire aboard USS LEXINGTON. The cross-axle landing gear pivoted at the center to absorb some of the landing shock. (Warren Bodie)





These P-12Cs were painted up as German "Fokkers" for the 1933 movie "Hell Below," a First World War air warfare epic. The P-12Cs were camouflaged in Green and Gray. (Fred Dickey)



Red Rippers F4B-2 from USS LEXINGTON with the Townend cowl ring panels removed for maintenance. The individual exhaust stacks were retrofitted to all F4B models. The aircraft in the background is an F3B-1 of VF-2. (Jeff Ethell)

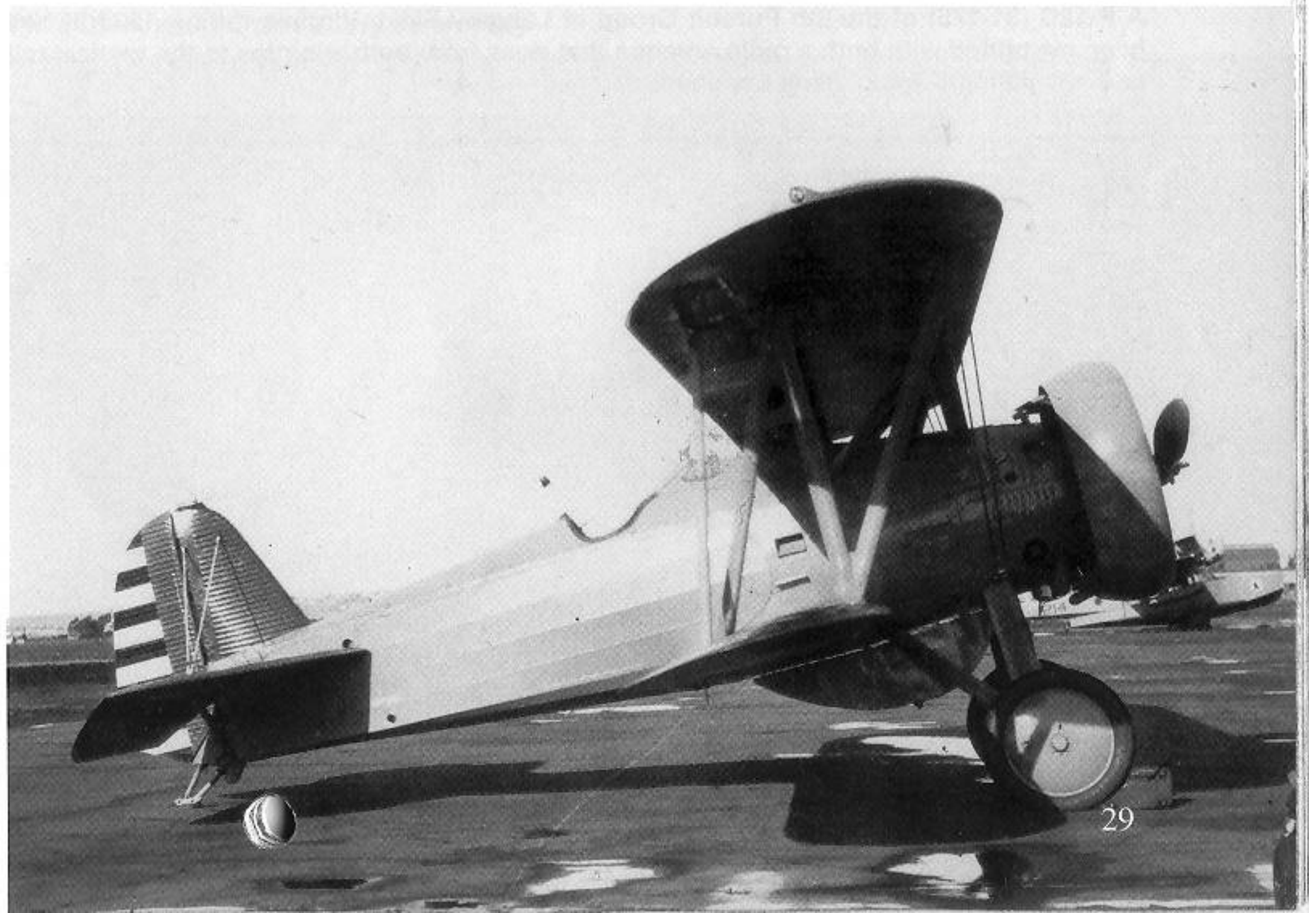
P-12D

Of the remaining forty aircraft on the original P-12B contract, thirty-five were completed as P-12Ds. Externally identical to the P-12C, the changes were all internal between the P-12C and P-12D. The P-12D was powered by a new Pratt & Whitney R-1340-17 Wasp radial rated at 525 hp.

Additionally, there were numerous instrument and internal equipment changes between the P-12C and P-12D, including moving the ignition wiring harness from the rear of the engine to the front. The first flight of a P-12D occurred on 2 March 1931. As with the earlier P-12B, P-12Cs and P-12Ds were later retrofitted with the larger P-12E vertical tail surfaces.

One P-12D was equipped with the experimental XGISR-1340E geared radial engine and designated as the XP-12H. After completing tests with the new engine, the XP-12H was later converted back to P-12D standards and put into squadron service.

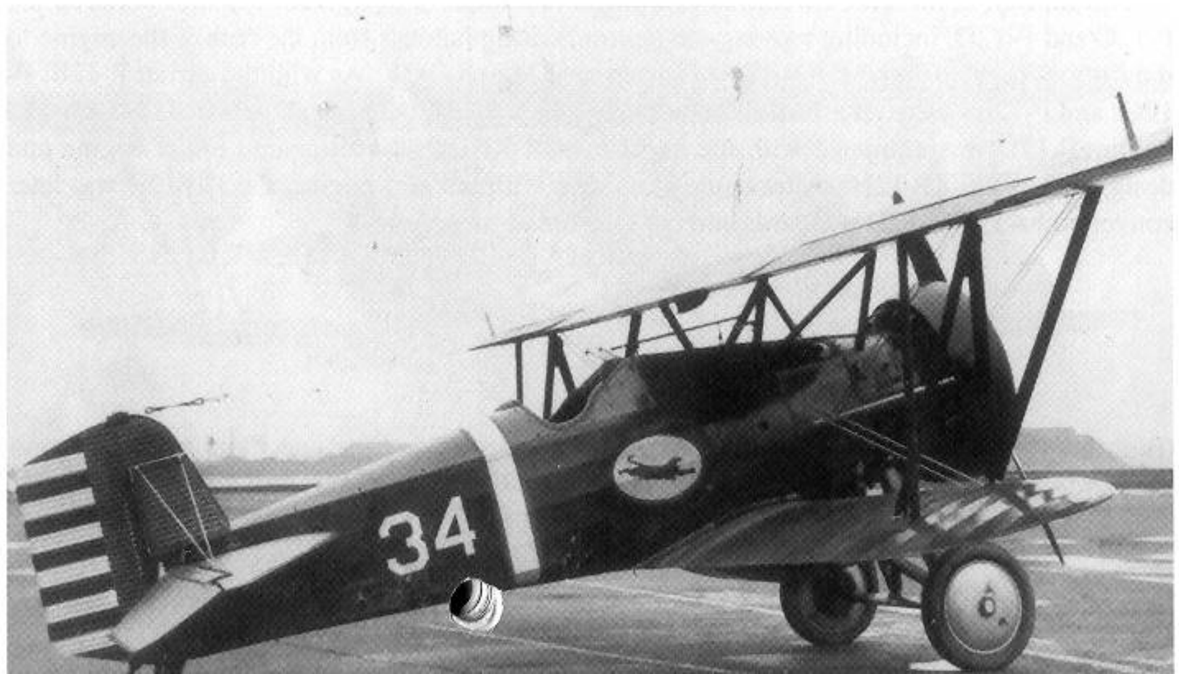
(Right) A P-12D on the ramp at Chanute Field during 1935. Chanute Field was the home for one of the Army Corps' advanced flying schools and this P-12D had a Light Blue fuselage in accordance with 1934 Army regulations for tactical aircraft. (Bob Esposito)

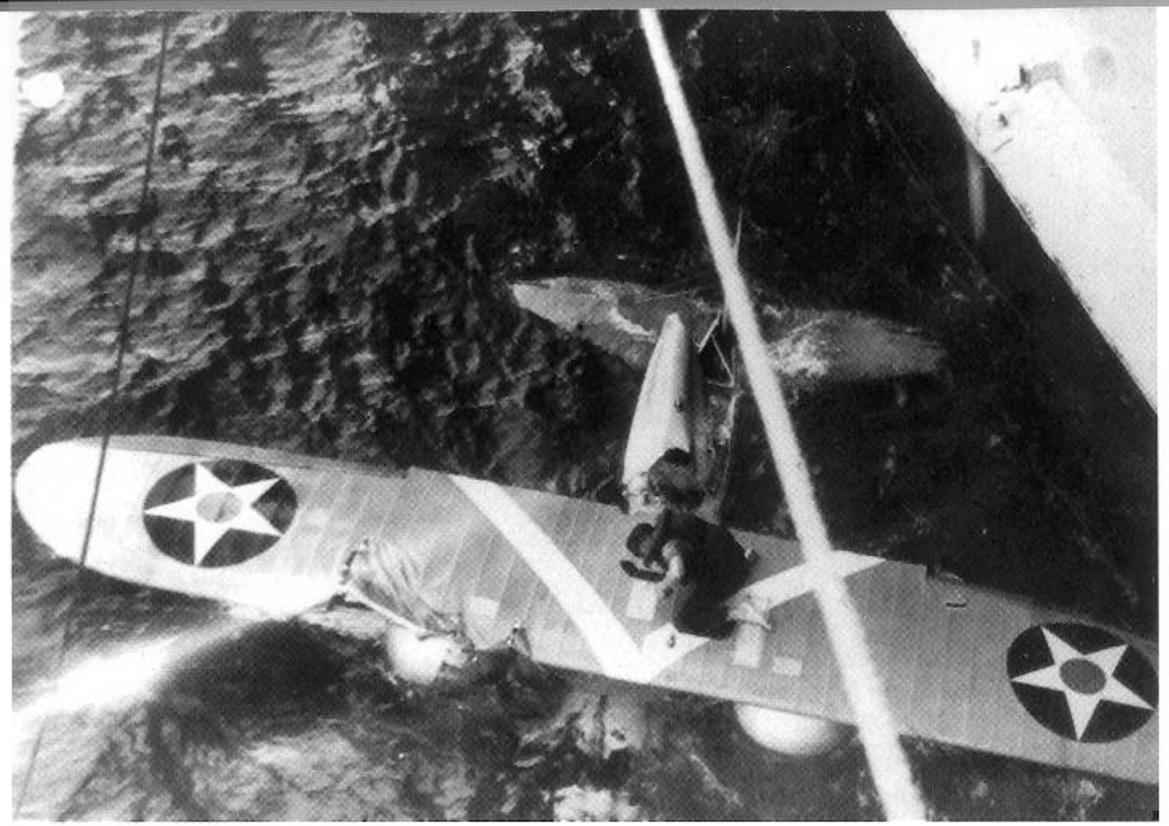


A P-12D (31-175) of the 8th Pursuit Group at Langley Field, Virginia during 1933. It has been retrofitted with both a radio antenna that goes from both wingtips to the vertical tail and navigational lights. (Bob Esposito)

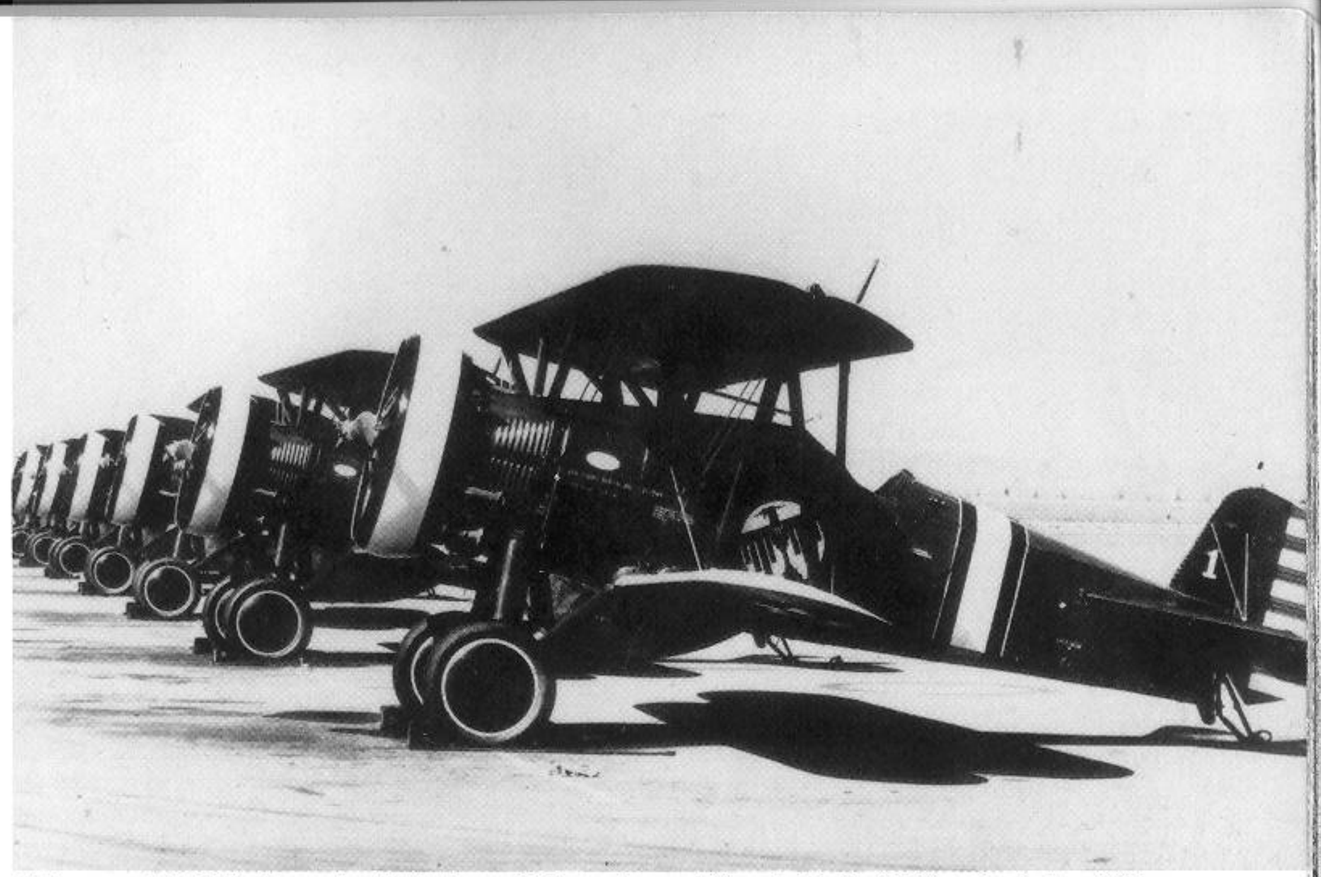
An F4B-2 from Fighting Two on USS LANGLEY during the mid-1930s. The aircraft has an F4B-4 vertical tail, a radio antenna and navigational lights that are different from those used on Army P-12s. LANGLEY aircraft had Lemon Yellow tail surfaces. (Bob Esposito)

A 35th Pursuit Squadron P-12D on the ramp at Langley Field, home for the 8th Pursuit Group during the mid-1930s. The P-12D was virtually identical to the P-12C except for some slightly different cowl ring shapes. (Bob Esposito)





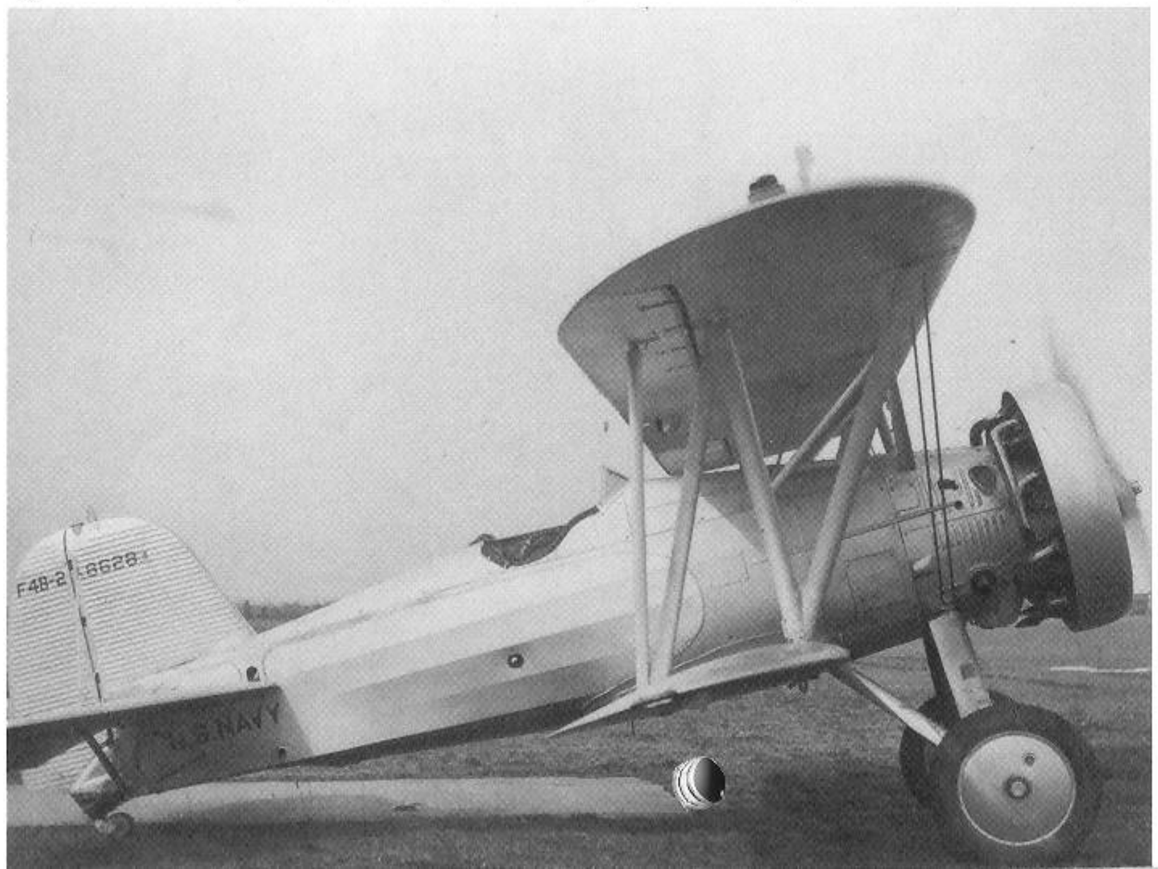
ENS Hill put this F4B-2 of Fighting and Bombing Five into the water alongside USS SARATOGA during February of 1932. The floatation bags in the upper wing kept the F4B afloat until rescue and salvage crews could attach a line to the aircraft so that it could be hoisted back aboard the carrier. (Dave Perry via Bob Lawson)

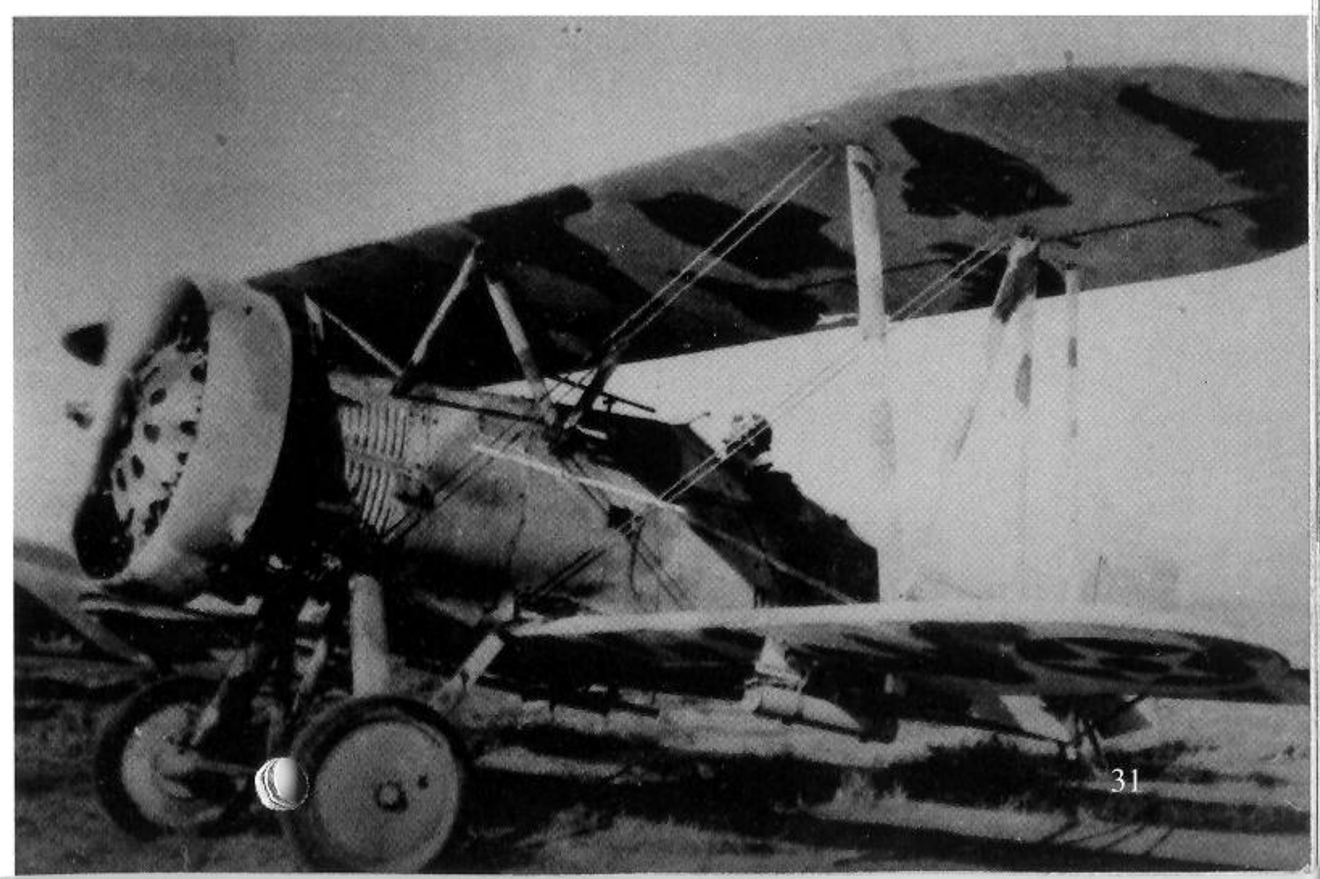


A lineup of P-12Ds from the 34th Pursuit Squadron at March Field, California during1931. The P-12D had the ignition wiring harness moved from the back of the engine to the front. The aircraft in the foreground was assigned to the 34th PS Commanding Officer. (AFM)

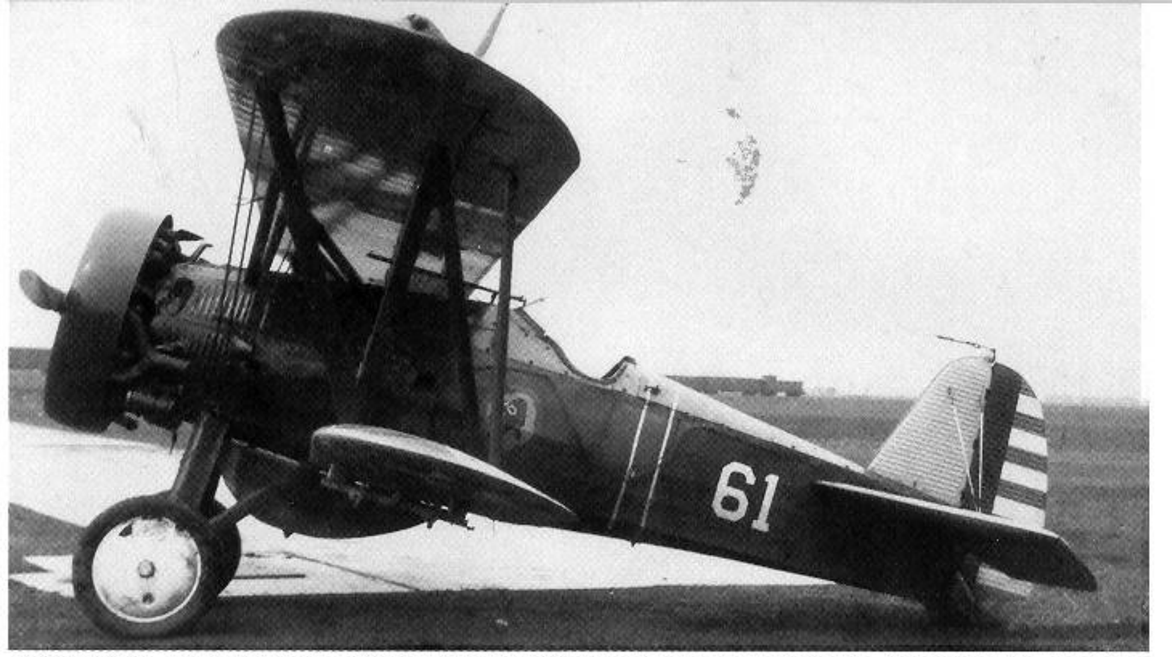
This F4B-2 has been modified with a short Townend cowl ring, F4B-4 vertical tail surfaces and chrome exhaust stacks. The aircraft was assigned to NAS Anacostia as a utility aircraft for Navy Headquarters personnel. (Vincent Berinati)

During the war games that Army Air Corps units participated in during the 1930s, many aircraft were camouflaged with water-based paints. This P-12D was painted with Green, Olive Drab, and Purple! (Larry Jamresko)





A P-12D from the 36th Pursuit Squadron on the ramp at Newark Airport during a 1935 air show. The use of Orthochromatic film makes the Yellow wings and tail surfaces appear almost as dark as the Olive Drab fuselage. (Vincent Berinati)



This P-12C (31-171) of the 36th Pursuit Squadron at Langley Field, Virginia has had the vertical tail surfaces of the P-12E retrofitted during overhaul and a steerable tall wheel has replaced the factory installed tail skid. (Bob Esposito)

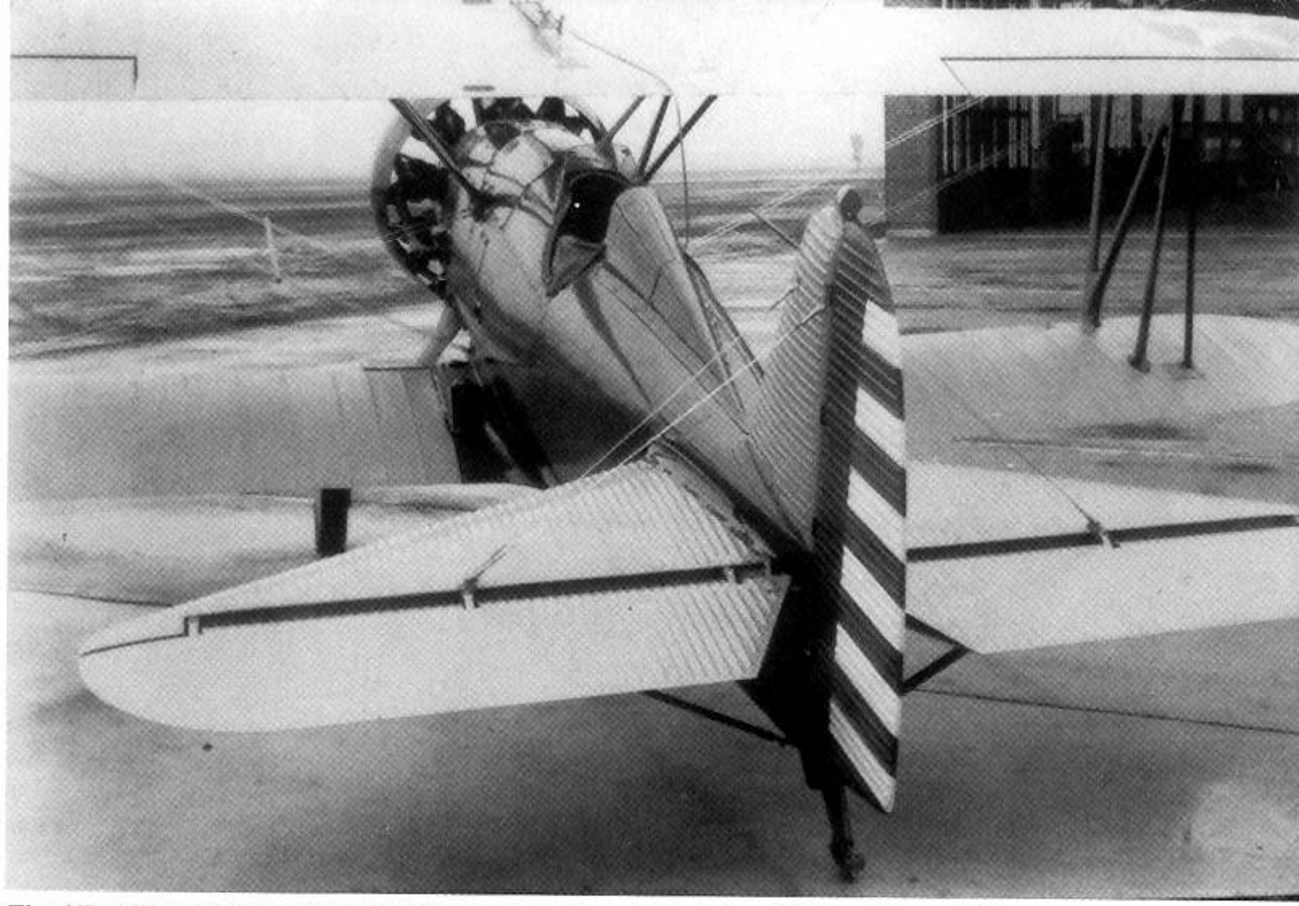
This P-12D is assigned to one of the Kelly Field school squadrons during 1937. The fuselage has been painted Light Blue, with Yellow wings and tail surfaces. The aircraft has been fitted with radio antenna masts on the wingtips and in front of the vertical fin. (Bob Esposito)

P- 12E/F/K

Although the P-12E "appears" to look radically different from any previous variant of the P-12 series, it is in fact basically the exact same aircraft. The P-12E was the production version of the Boeing Model 218. The Model 218 was a Boeing-funded program to put a metal skin on the P-12 airframe. There were several changes that went along with the all-metal, monococque fuselage that created a totally new "appearance" to the aircraft.

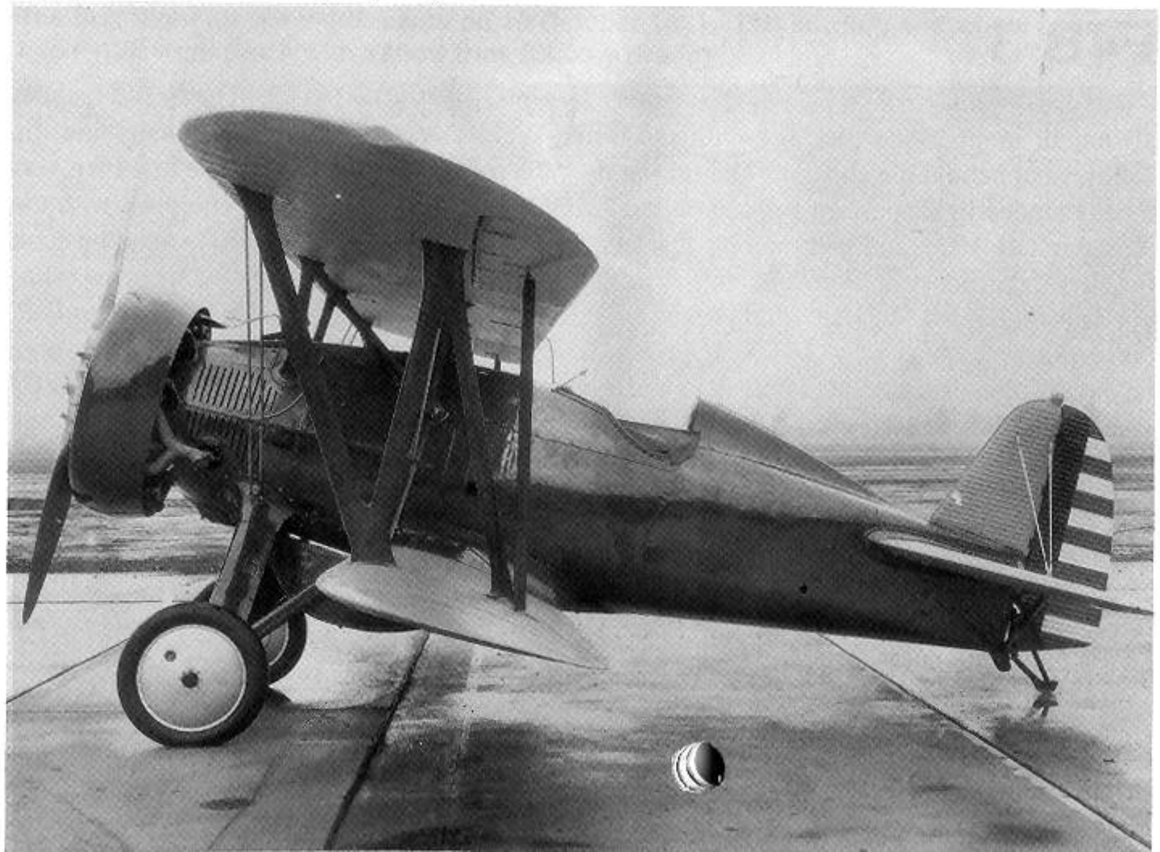
A rollover bar was added to the fuselage framing just behind the cockpit area which was then faired into the upper fuselage spine. This fairing also housed the floatation gear previously found in a compartment in the upper wing. The vertical tail surfaces were increased in height and had a much smoother, rounded planform. Both of these new features created the appearance of a much shorter, totally new aircraft. In fact, the Model 218 was exactly the same length as the P-12C/F4B-2, twenty feet three inches. The power plant remained the same Pratt & Whitney R-1340-17 Wasp rated at 500 hp at 8,000 feet.

Tests of the Model 218 proved quite satisfactory to the Army and an order for 135 P-12E aircraft was issued on 3 March 1931. The prototype Model 218, Army designation XP-925, was sold to China, where it distinguished itself in combat. The aircraft was used by Robert Short to shoot down two Japanese fighters over Shanghai before being shot down himself. The first flight of a production P-12E took place on 15 October 1931. The external appearance was again changed with the addition of the so-called "Panama Kit Conversion." The Army pilots at France Field in the Panama Canal Zone spent many hours flying over both the Atlantic and Pacific Oceans -- all without benefit of a life raft in case of an emergency over the ocean. The Army and Boeing remedied this by extending the rollover bar fairing straight back almost to the vertical tall surfaces. Within the larger fairing was a compartment for a one man life raft.



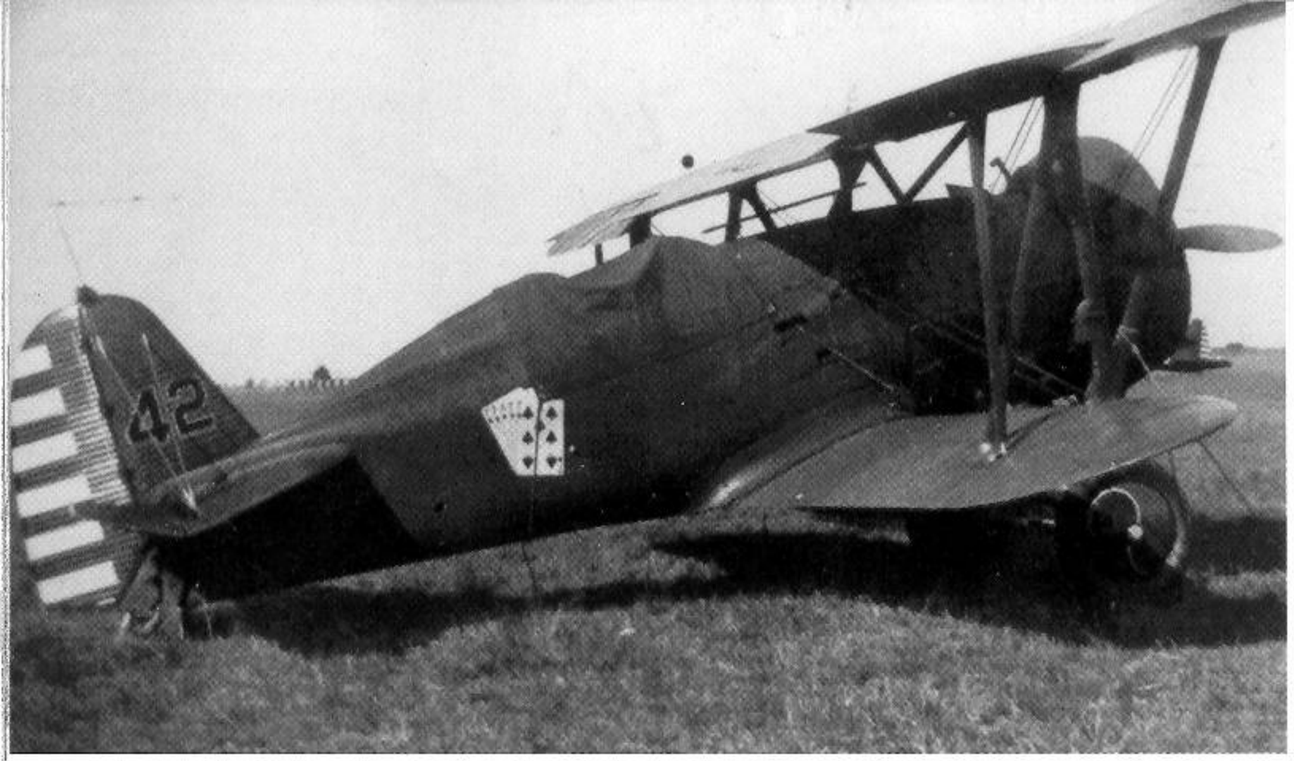
The XP-12E rolled out from the Boeing plant on 1 October 1931. Although it appears to be dramatically redesigned from all previous models, the P-12E actually differred only in having a "rollover fairing" on top the fuselage spine and an enlarged vertical tail. (Robert F. Dorr)

The XP-12G was a standard P-12B airframe equipped with a turbo-supercharged Pratt & Whitney YISR-134OG engine and Townend cowl ring, both of which helped raise the top speed to over 190 mph. (AFM)



Although the Army ordered 135 P-12Es, only 110 were built as P-12E. And several of that number were modified to other variants. One airframe had a Pratt & Whitney R-1340-23 engine rated at 575 hp under the designation P-12J. This same airframe plus the XP-12E and five standard P-12Es, were later modified by having the Pratt & Whitney R-1340-17 engine fitted with the experimental Type G2 fuel injection system. These aircraft were all designated as YP-12K. One of the YP-12Ks was further modified with a Type F7 turbosupercharger and designated as the XP-12L4. By 1938; however, all the YP-12Ks had been brought back to standard P-12E specifications and placed in regular Army service.

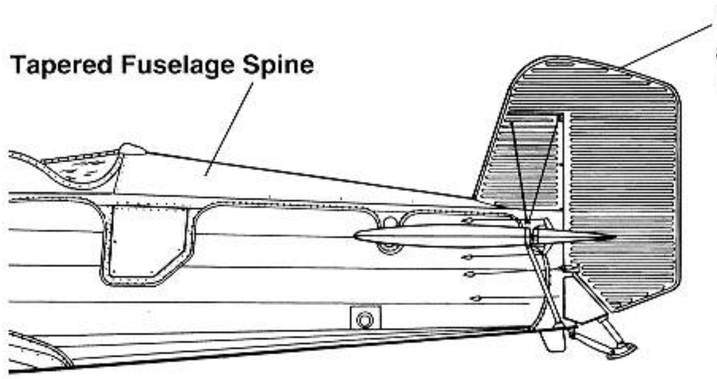
The last twenty-five airframes of the original P-12E production contract were completed as P-12Fs. These differed from the P-12E in having the Pratt & Whitney R-1340-19 engine, which developed 600 hp on takeoff and 500 hp at 11,000 feet, rather than at 8,000 feet as on the P-12E. One of the changes with the new engine was replacement of the individual exhaust stacks with an exhaust collector ring. The last ten P-12Fs had a steerable tail wheel in place of the castoring tail skid found on previous variants. The Army; however, retrofitted the tail wheel assembly and the exhaust collector ring to all P-12E and P-12F aircraft still in the inventory. The last P-12F was fitted with a full cockpit enclosure with a sliding canopy. The P-12 series was the last biplane in major service in the U.S. Army. But the open cockpit pursuit plane would remain the standard at least through the next generation of fighter aircraft - the Boeing P-26.



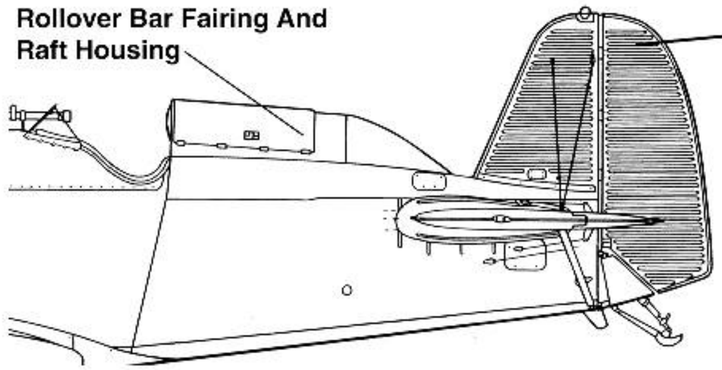
A P-12E from the 77th Pursuit Group at Barksdale Field, Louisiana. The P-12Es were delivered in standard Air Corps color scheme of Olive Drab with Yellow wings and tail surfaces, although the use of orthochromatic film makes the Yellow appear much darker. (Robert L. Cavanaugh)

Fuselage Development

P-12C/D



P-12E



The second aircraft on the original F4B-3 production order following its rollout in December of 1931. The F4B-3 was a navalized version of the P-12E, but had a reshaped vertical fin, a tail wheel and carrier arresting gear. (Warren Bodle)

F4B-3

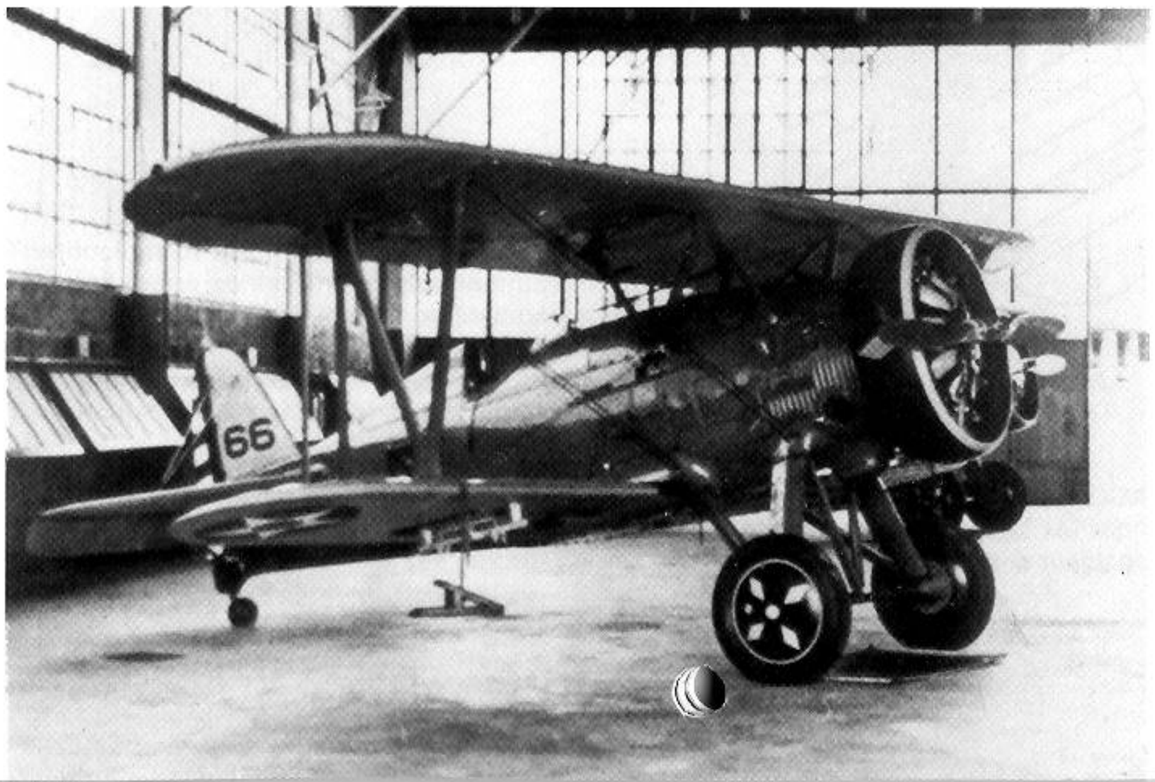
The F4B-3 was the Navy production variant based on the Army P-12E. The F4B-3 had the all-metal, monocoque fuselage with the taller, redesigned vertical tail surfaces, and the rollover bar behind the cockpit. The fairing over the rollover bar on the F4B-3; however, was more rounded in shape than the one on the Army P-12E. The F4B-3 was equipped with the steerable tail wheel and had the rear fuselage reinforced and equipped with an arrestor hook for aircraft carrier operations. Aircraft slated for the U.S.Marine air arm were delivered without arresting gear, although it could be reinstalled at any time. On 23 April 1931, the U.S. Navy ordered a total of 127 Model 235 airframes (F4B-3) from Boeing. Only twenty-one; however, were completed as F4B-3. Fourteen were completed as Model 256, an export version of the F4B-3 for use by the Brazilian Air Force. Deliveries of the F4B-3 began in late 1931 when VF-1B aboard USS SARATOGA accepted their first aircraft.

F4B-4

The F4B-4 was identical to the F4B-3 with the exception of the vertical tail surfaces and rollover bar fairing. The vertical tail surfaces were greatly enlarged to improve directional stability and control. The headrest and rollover bar were enlarged, as was the fairing over the

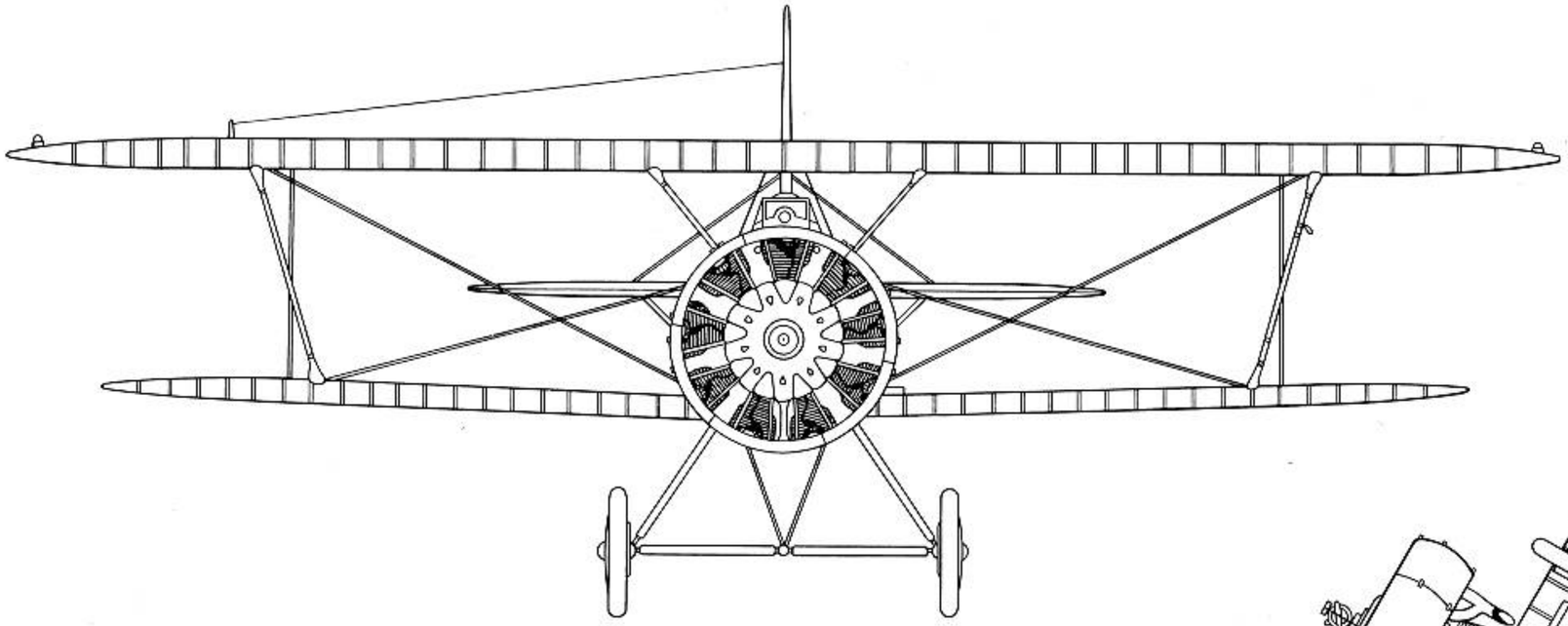
A very colorful F4B-3 assigned to the Marine Headquarters Detachment at Naval Air Station Anacostia, just outside Washington, D.C. during 1935. This F4B-3 was used for aerial demonstrations and has a Red, White, and Blue cowl, wheels, and rudder. The remainder of the aircraft was in the standard Gloss Gray fuselage, Yellow upper wing, with Silver under the upper wing and overall lower wing. (Don Garrett Jr.)

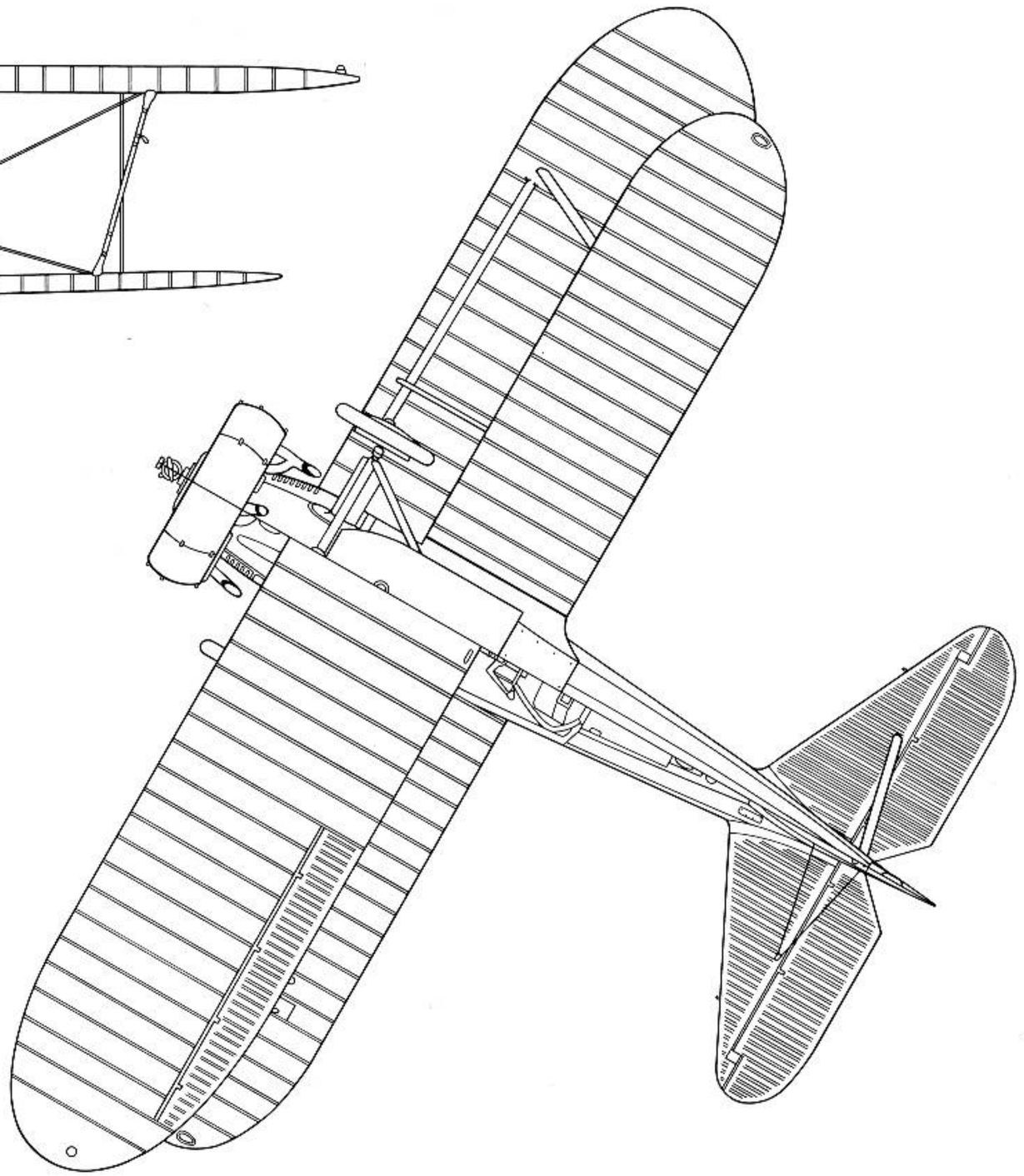
A P-12E from the 24th Pursuit Squadron based at Albrook Field, Panama Canal Zone. The first flight for the P-12E came on 15 October 1931. The cowling and wheel covers of this P-12E were Black with Yellow trim. (Sidney Bradd)



rollover bar assembly. Later, after production had begun, the fairing was again enlarged to offer space for the stowage of a one man life raft. The exhaust collector ring was also fitted to the 550 hp Pratt & Whitney R-1340-16 Wasp radial and these exhaust collector rings were retrofitted to some previous models. Armament remained constant with the other P-12/F4B variants, a pair of .30 caliber machine guns in the cowl, plus two underwing bomb racks that could hold up to a 125 pound bomb. F4B-4 production totaled ninety-two aircraft.

The first units to become operational with the F4B-4 were VF-3B on USS LANGLEY, and VF-6B aboard USS SARATOGA, plus VF-10M with the Marines. The F4B-3/-4 was the front line fighter aircraft for the Navy until they were replaced with the first of the Grumman Iron Works fighters, the F2F/F3F series during 1938. In any event, they continued in a reserve and trainer status into the beginnings of the Second World War. A great many were expended as target drone aircraft for aerial and surface gunnery practice. Included among these target drones were some ex-Army P-12s that were designated F4B-4A. Although the Army P-12E was the final production biplane aircraft in that service, the F4B series would be followed by two more biplanes -- the Grumman F2F/F3F and Curtiss SBC Helldiver, before this class of fighter was phased out in favor of the monoplane forever.



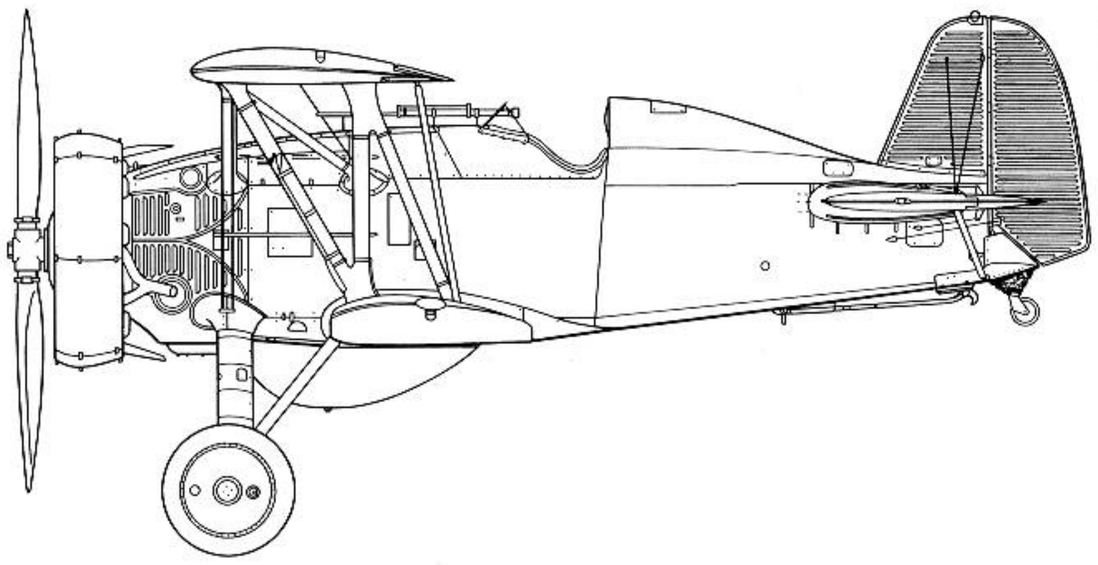


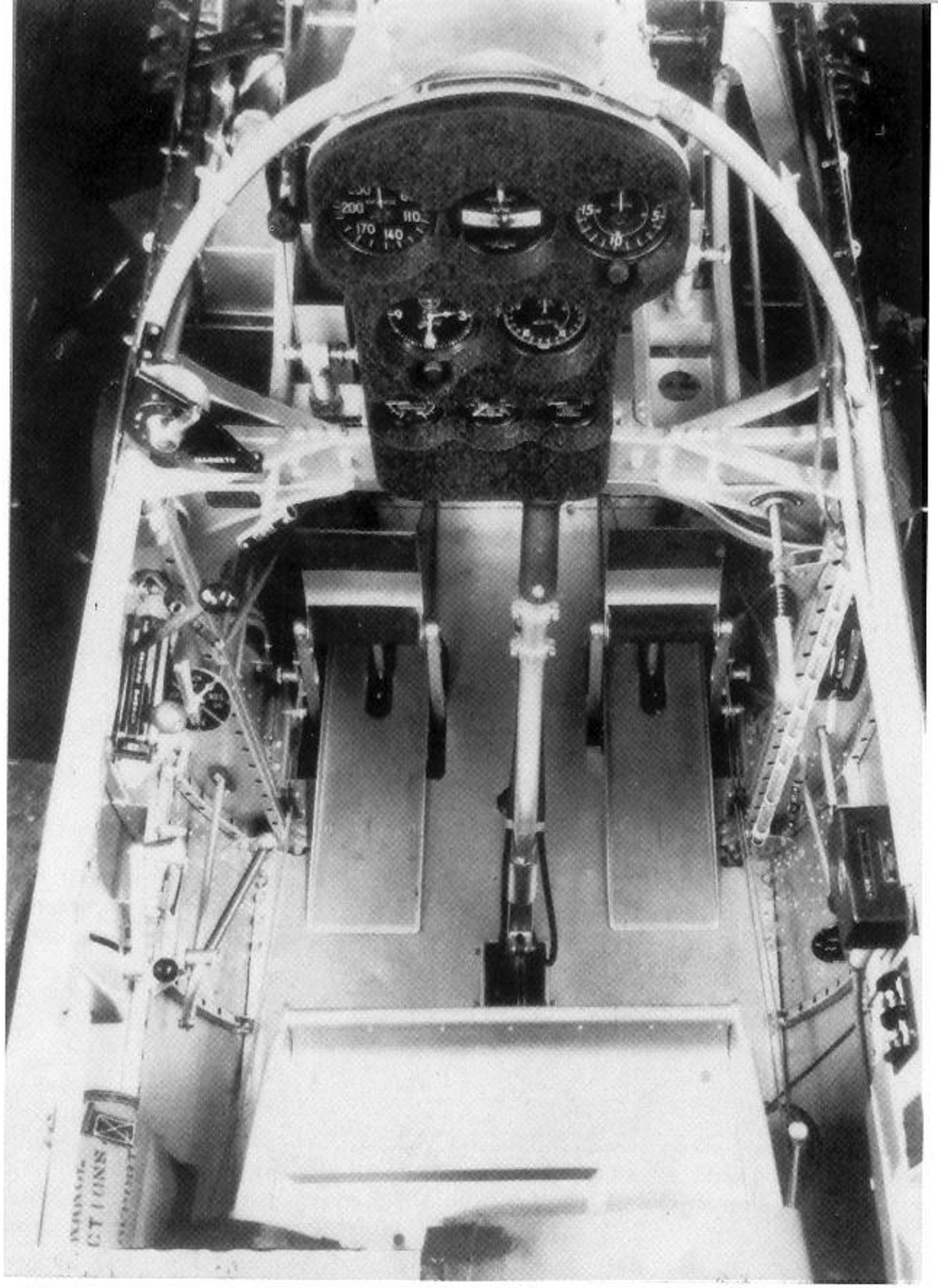
Specifications

Boeing F4B-3

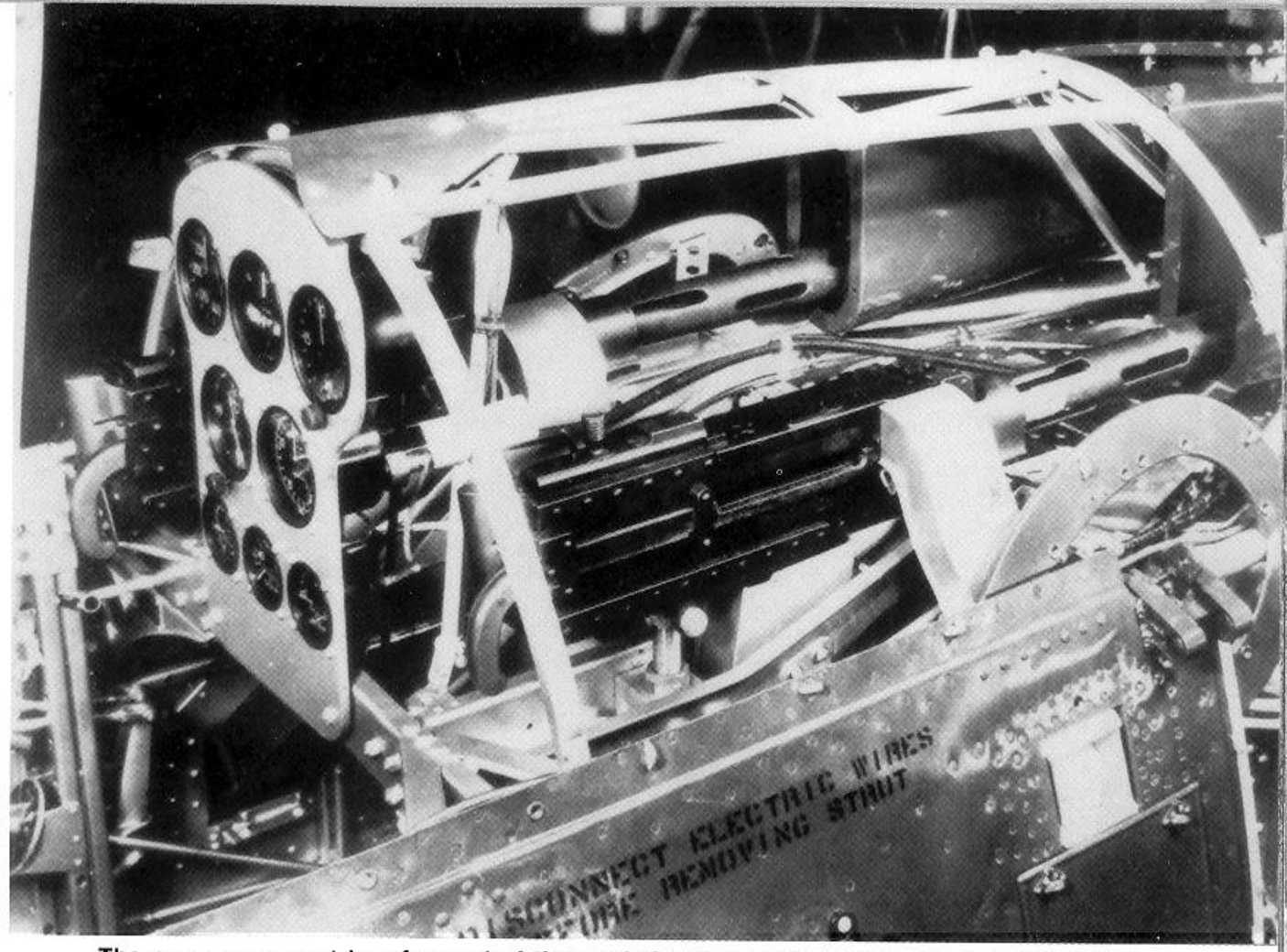
Wingspan.....30 feet (9.14m)
Length.....20 feet 4 inches (6.24 m)
Height.....8 feet 9 inches (2.67 m)
Empty Weight.....2,185 pounds (991.11 kg)
Maximum Weight.....2,675 pounds (1,213.3kg)

Powerplant.....One 500 hp Pratt & Whitney R-1340 Wasp air-cooled radial engine
Armament.....One 30 caliber and one .50 caliber machine guns or two .30 caliber guns
Speed.....190 mph (305.7 kph)
Crew.....One





The cockpit of the P-12E/F4B-3 was very simple with the flight instruments grouped in the center and engine instrument on the lower panel. The instrument panel has a Black leather padded cover, while the rest of the cockpit was Natural Metal. The gun charging handles are visible on either side of the instrument panel. The large plates below the instrument panel are the rudder pedals. The circular Black switch below the throttle is the fuel selector panel. (AFM)



The open armament bay forward of the cockpit on a P-12E reveals the two .30 caliber machine guns, charging handles, gun mounts and ammunition feed chutes. Some P-12E/F4B-3s had a single .30 caliber machine gun and single .50 machine gun as standard armament. (AFM)

(Right) An F4B-3 from Fighting One (VF-1) Top Hatters launches from USS SARATOGA during 1932. The F4B-3 was the fastest of the Navy variants with a top speed of 187 mph and a range of over 750 miles. The aircraft carries a White Battle E award on the fuselage just forward of the cockpit. (U.S. Navy)

The classic beauty of the P-12/F4B design is shown by this factory-fresh F4B-3 in early U.S. Navy markings during a delivery flight in 1932. Very few Navy aircraft had the vertical tail stripes. The aircraft was equipped with factory-installed navigational lights on the wintips and fin tip. (Warren Bodie)

An F4B-3 from Fighting One (VF-1) aboard the USS SARATOGA during 1932. The aircraft was assigned to the VF-1 squadron commander, as indicated by the 1-F-1 code. The very tall antenna mast was fitted to many F4B-3s and -4s. The tail assembly is Red, as are the command stripes on the fuselage and wing. (U.S. Navy)

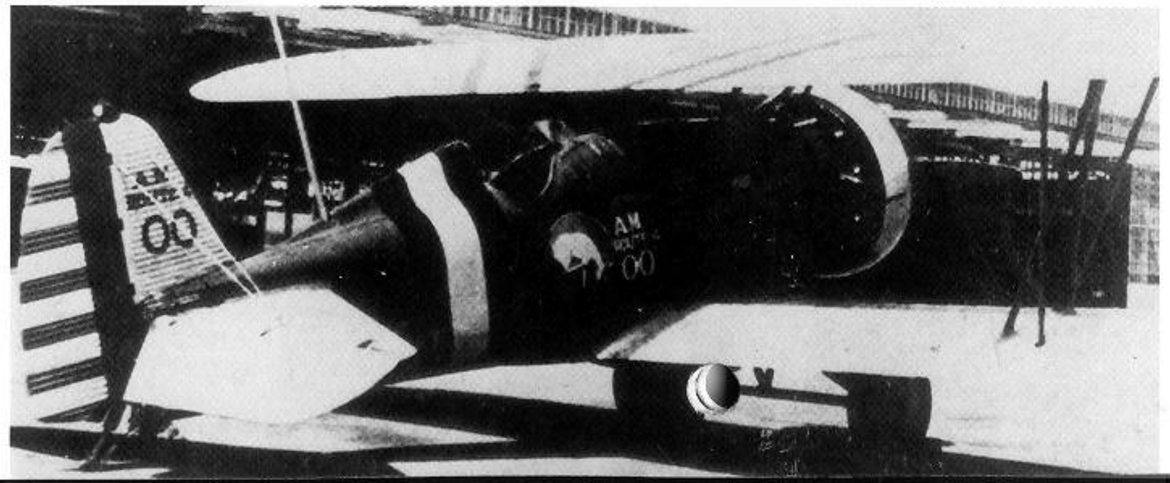
One F4B-3 was transferred from the Marine Corps Headquarters Detachment to the Navy at Anacostia between June 1934 and June 1935. All Anacostia aircraft had highly polished metal fuselages, with Yellow upper wings and Silver lower wings. (Bob Esposito)

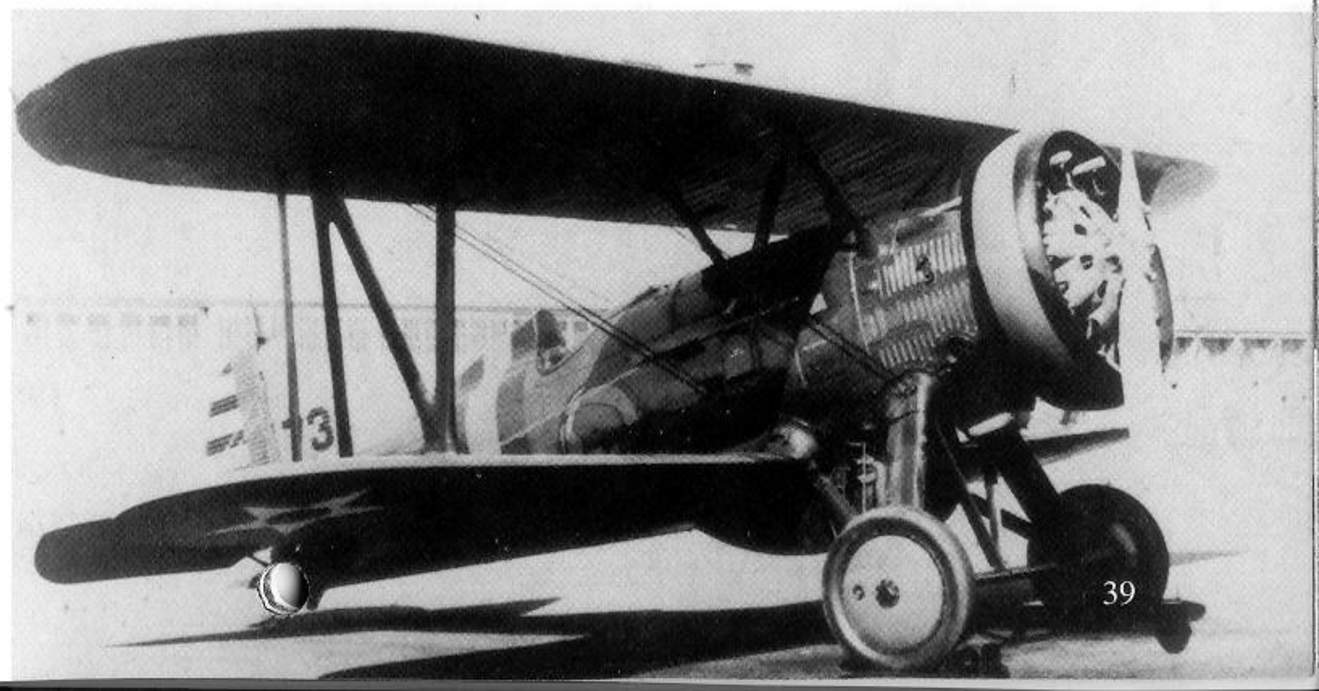
This F4B-3 (BuNo 8900) has been equipped with a life raft stowage compartment in the rollover fairing on the fuselage spine similar to that used on the later F4B-4. The installation above the upper wing center section is gun camera mounting and the tube extending from the windshield is a telescopic gun sight. (Bob Esposito)

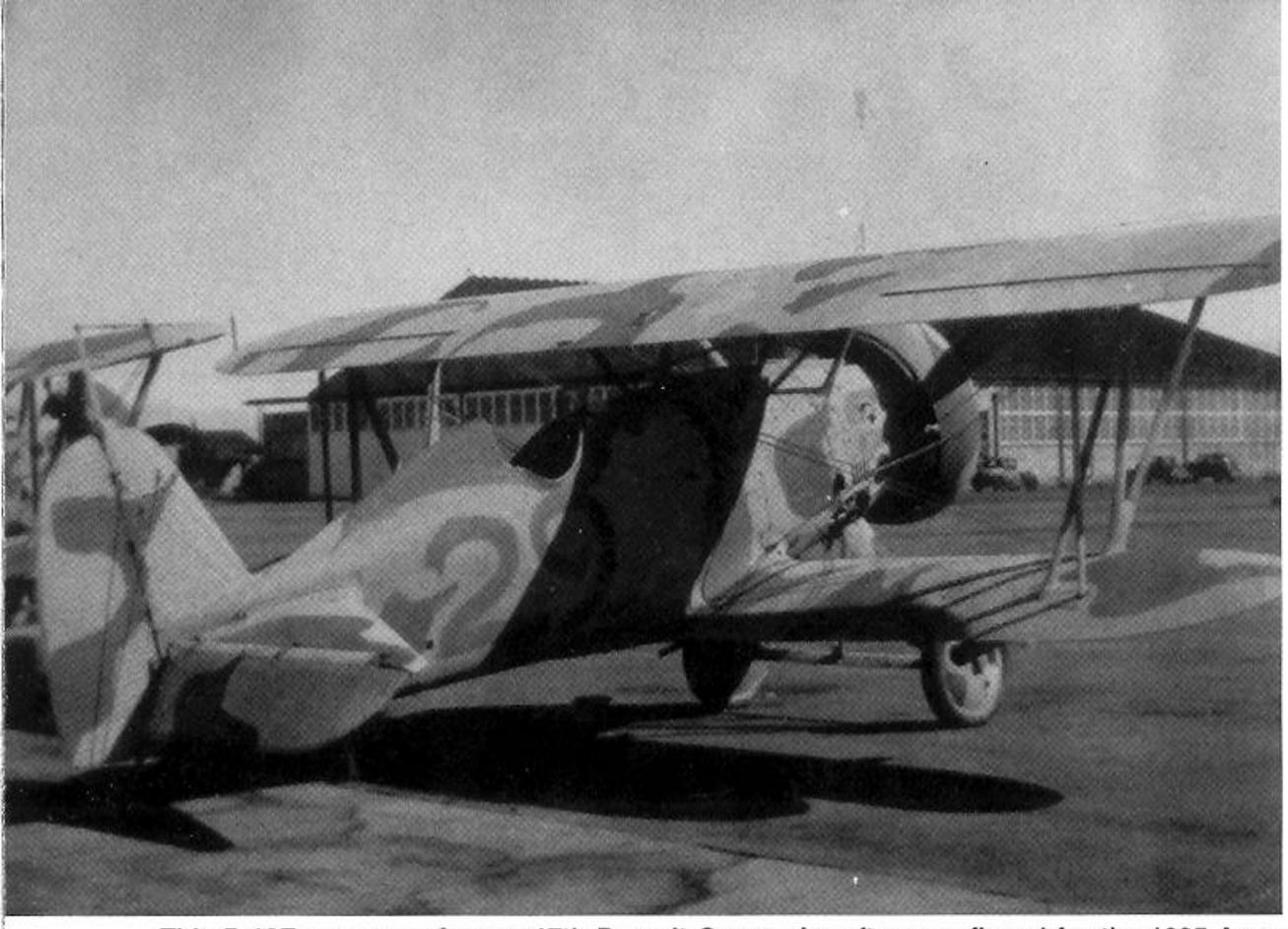
This P-12E was assigned to the Deputy Commander of the 8th Pursuit Group at Langley Field, Virginia during 1935. The colors of all the 8th PG squadrons are represented on the engine cowl ring and wheel covers. P-12Es were retrofitted with tail wheels derived from their Navy F4B cousins. (Jack Binder)

(Right) A P-12E from the 95th PS at March Field, California during 1933. Boeing built 110 P-12Es for the Army Air Corps. The cowl, wheels, fuselage, and wing bands are Black and Yellow. (Robert L. Cavanaugh)

This P-12E was assigned to the commander of the 95th PS and was one of many Air Corps aircraft used in the Air Corps Mail Operation in 1934, Following multiple crashes the use of Army planes to deliver air mail was halted after four months. (AFM)







This P-12E was one of many 17th Pursuit Group aircraft camouflaged for the 1935 Army war games. The aircraft was camouflaged in Sand, Dark Green and Neutral Gray. Even the number was done as part of the camouflage. (AFM)

A P-12E assigned to the commander of the 27th Pursuit Squadron rolls into a turn over Detroit during 1932, The multiple command stripes repeated on both the top and bottom of the upper wing identified the aircraft as being assigned to the squadron commander. (AFM)

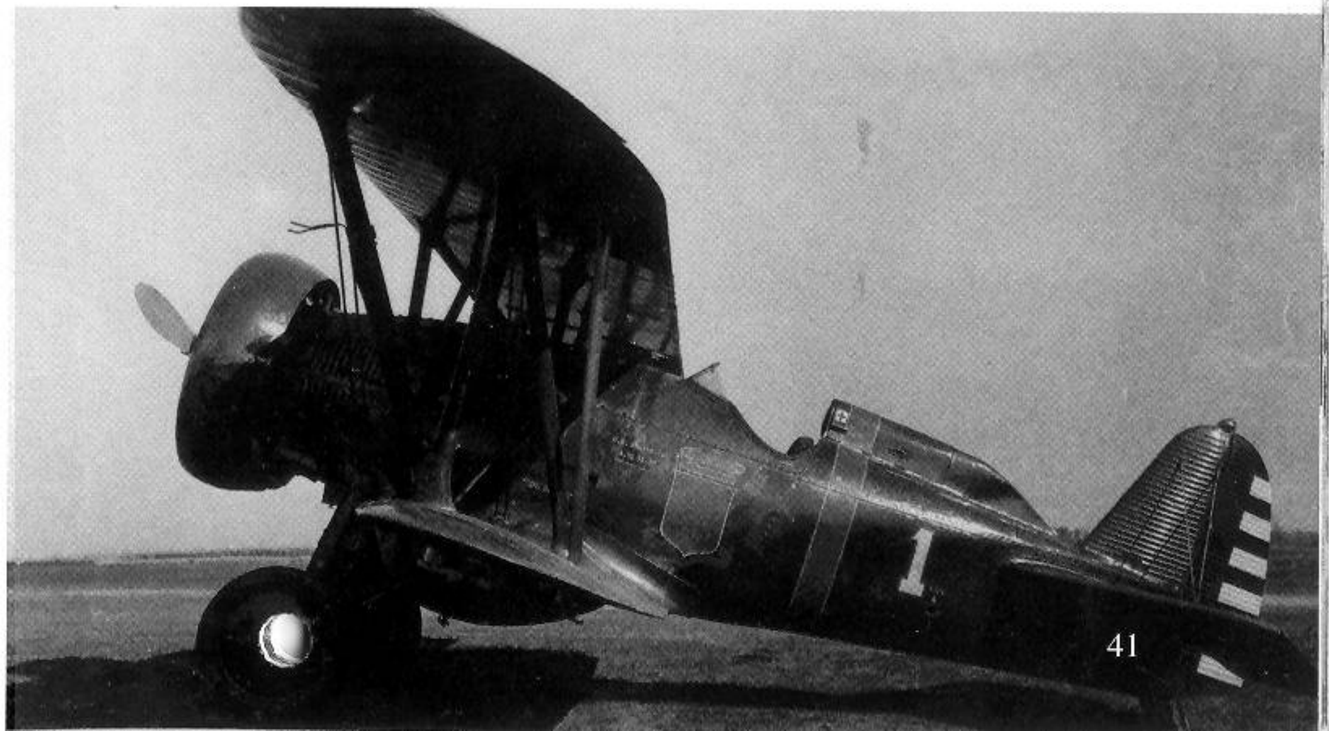
The third P-12F (37-80) was delivered to the 36th Pursuit Squadron at Langley Field, Virginia during April of 1932. Except for the engine change, the first fifteen P-12Fs were identical to the P-12E. The fuselage and wing bands are Red with White trim. (Jack Binder)

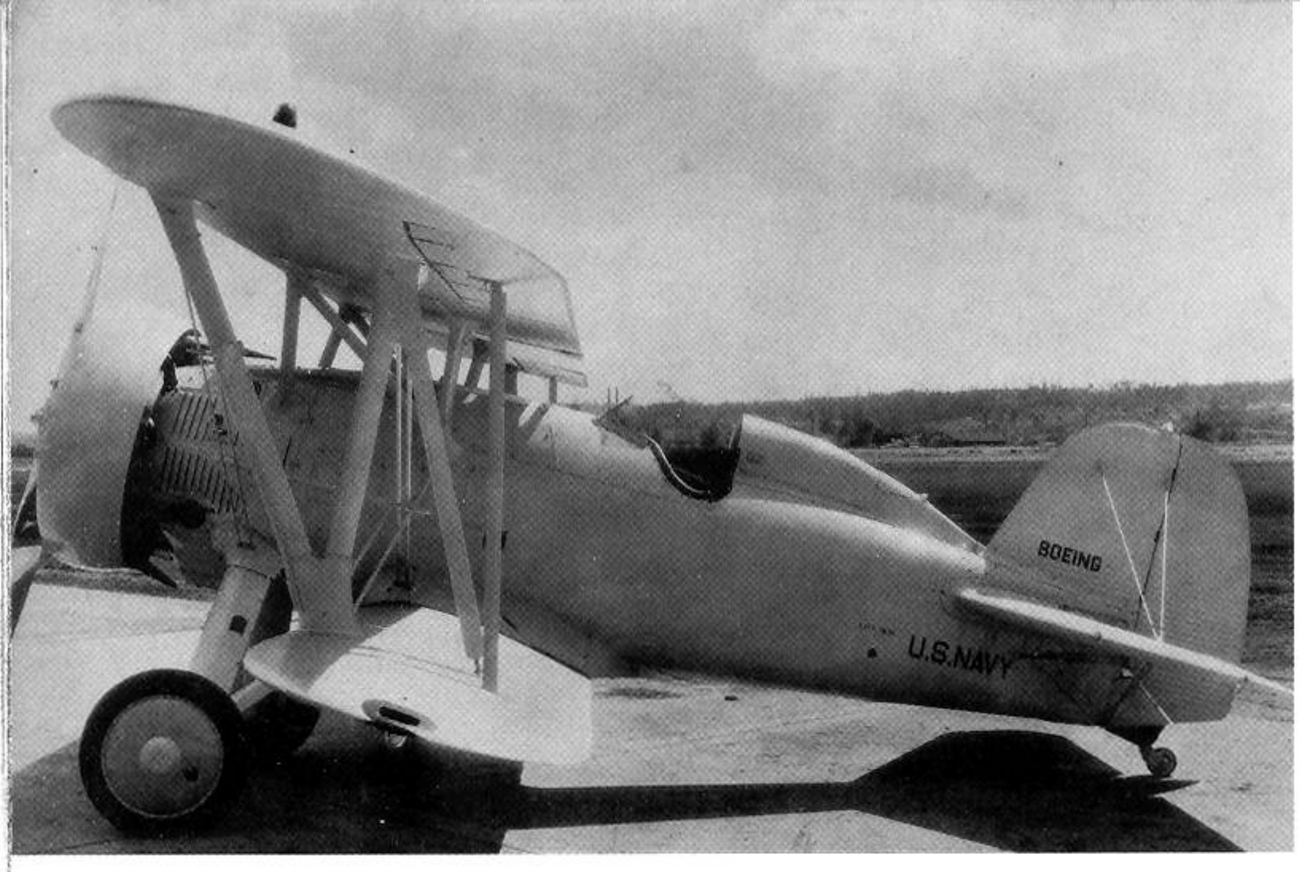
The last of twenty-five P-12Fs (serial 32-101) was modified at Boeing with a sliding glass canopy and clear panels behind the cockpit for rearward vision. Although ahead of its time and not put into service, this aircraft foretold of things to come and within a few years all fighter aircraft would be so equipped. (AFM)

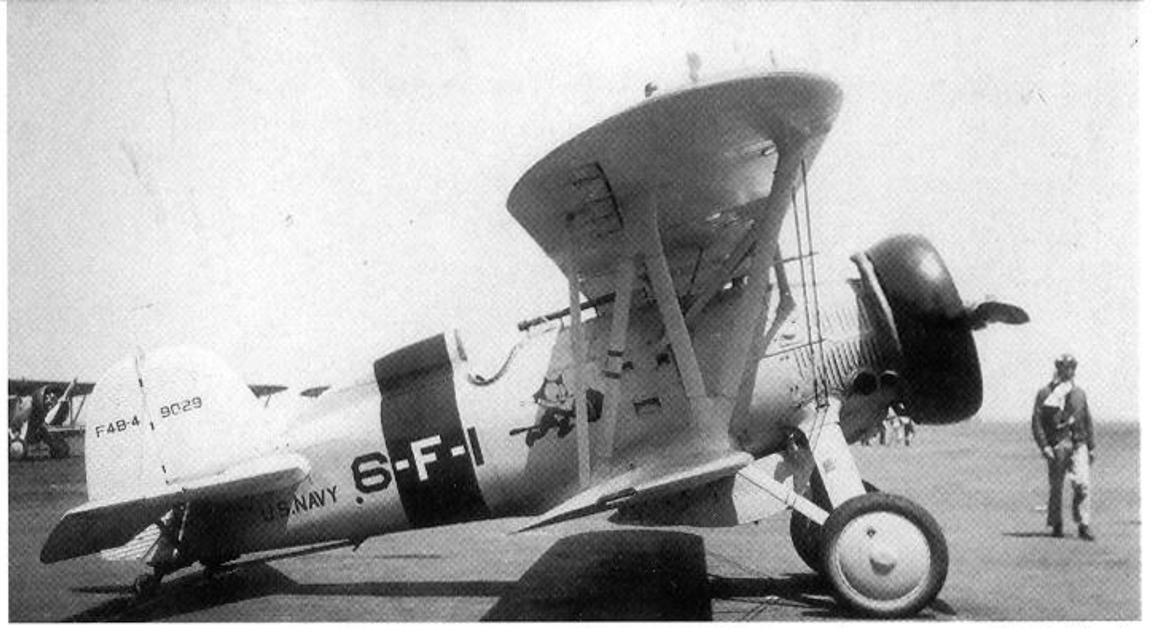
This YP-12K from the 27th Pursuit Squaron at Selfridge Field has skis mounted for winter operations. The YP-12Ks were standard P-12Es powered by fuel-injected Pratt & Whitney SR-1340E engines. All P-12Ks were reconverted to P-12E standards in June of 1938. (Bob Esposito)

A P-12F from the 24th PS on the ramp at Albrook Field, Panama CZ. The P-12F used a Pratt & Whitney SR-134OG engine that delivered 500 hp, but at some 3,000 feet higher than on the SR-1340E. The cowl and wheels are Red with Yellow trim. (MSGT Adam Golden)

This P-12K (serial 32-37) was assigned to the Group Commander of the 8th Pursuit Group at Langley Field, Virginia. Although most sources do not list this aircraft as one of the six P-12Es converted to YP-12K standards, close examination of the data block clearly shows it to be a P-12K. (Vincent Berinati)



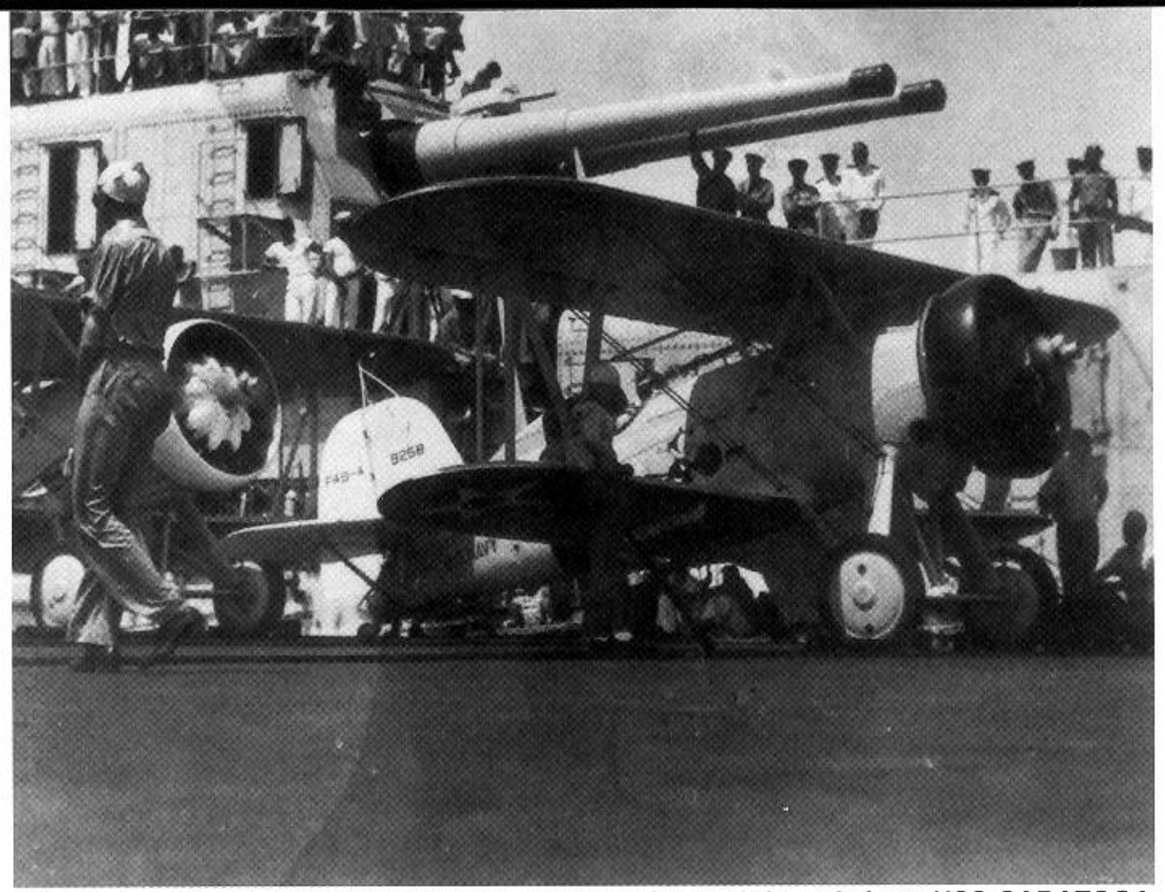




An F4B-4 from Fighting Six aboard the USS SARATOGA on the ramp at NAS North Island, California during 1936. All the improvements called for throughout the F4B series were incorporated into the F4B-4. (Vincent Berinati)

(Left) Rollout of the XF4B-4 came in July of 1932. It differred from the F4B-3 in having a larger vertical tail and rollover bar fairing. A hand hold was cut into the lower wing tip of all Navy carrier-based aircraft to allow a "wing walker" safety man to actually hold on to the aircraft. (Waren Bodie)

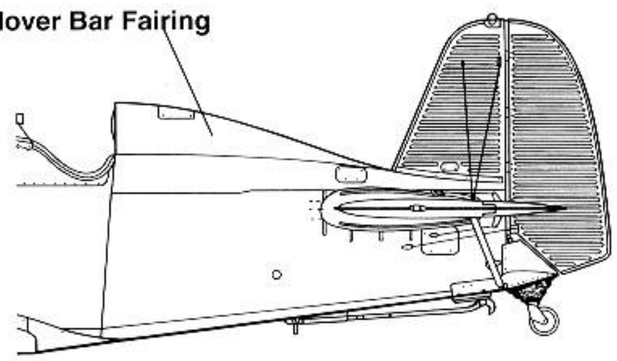
F4B-4s from VF-9M on the ramp at Marine Corps Air Station Quantico, Virginia during 1935. The Marine Corps received 21 of the 92 F4B-4s built by Boeing. Marine F4B-4s were identical to Navy F4B-4s minus the carrier arresting gear, which could be mounted at any time. (Jack Binder)



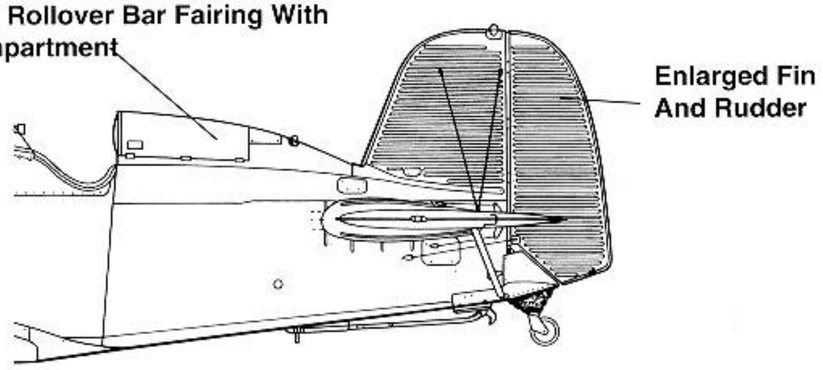
An F4B-4 from Fighting and Bombing Six ready for deck launch from USS SARATOGA during 1934. VF-6B began as VB-2B, which was changed to VF-6B, then to VF-3 -- all this within a few years and without changing emblems or markings. (U.S. Navy)

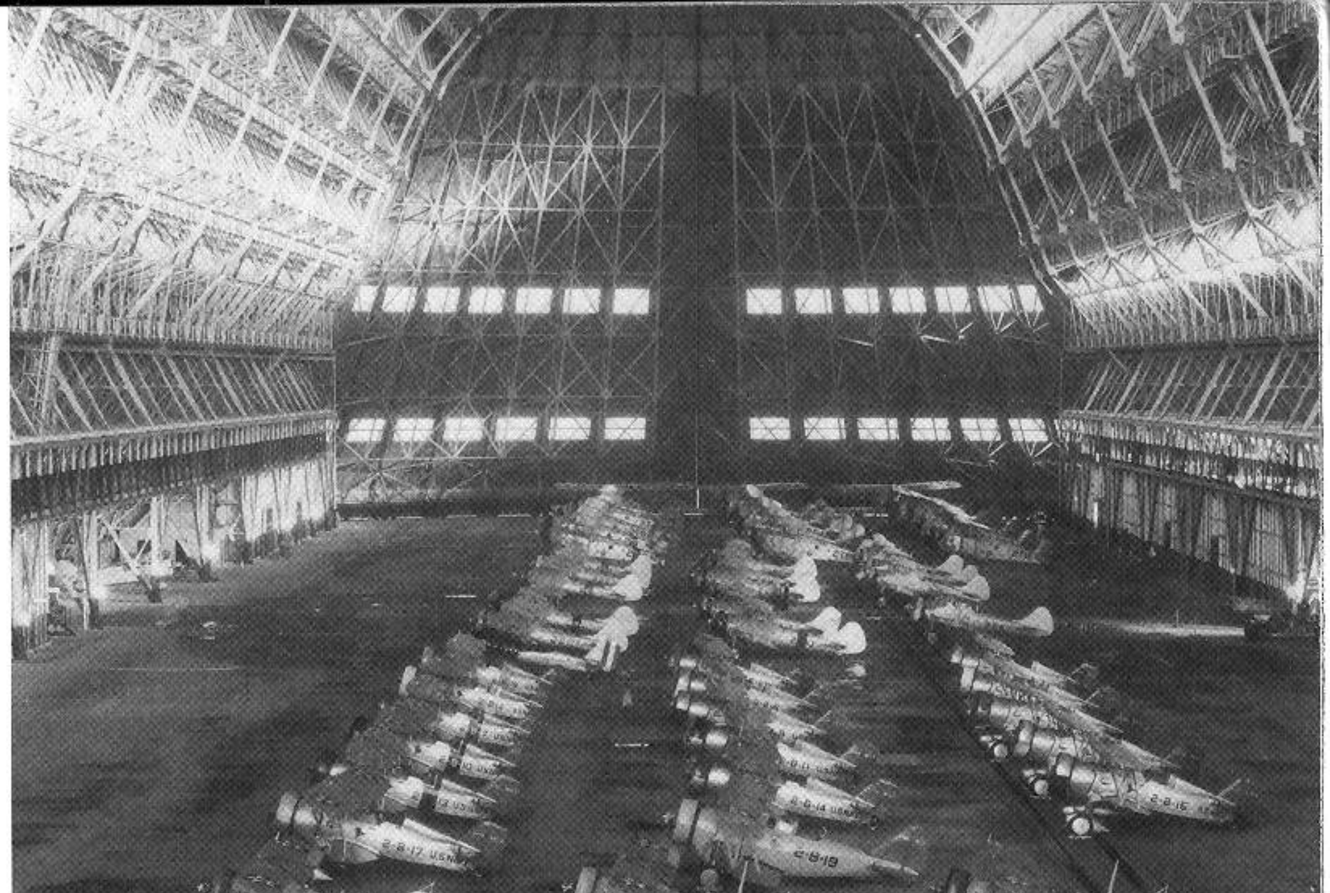
Fuselage Development

F4B-3



F4B-4

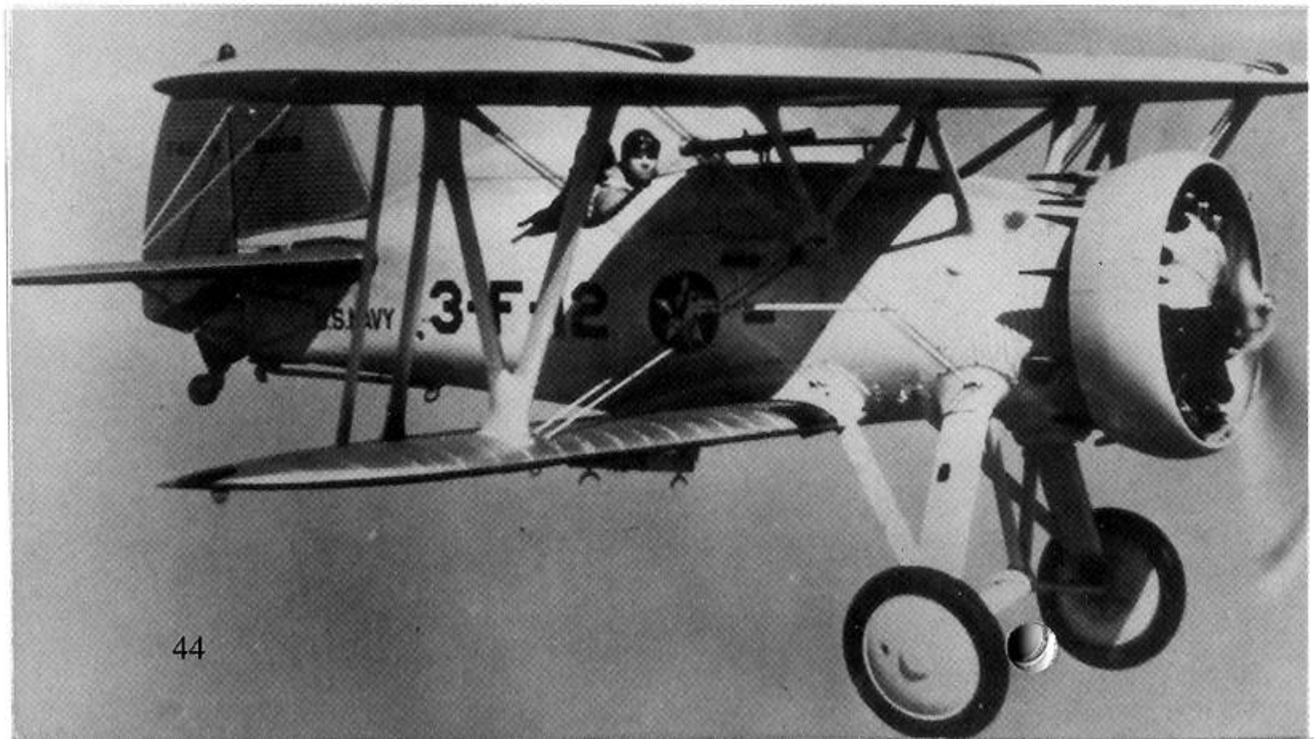




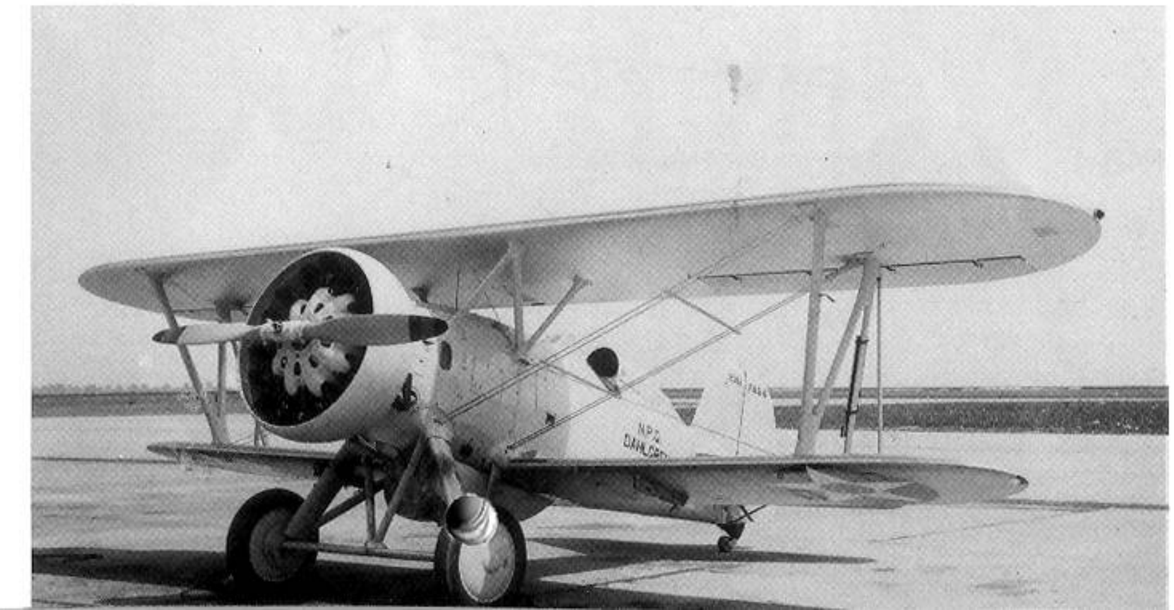
The interior of the Navy blimp hangar at NAS Sunnyvale, California is packed with F4B-4s of VF-6 and, F11C-2s of VB-2, along with Vought Corsairs from VS-2 and torpedo bombers from VT-2. (USN vai Bob Larkin)

An F4B-4 from VF-3B off USS RANGER during 1935, clearly showing the Silver painted wings, Gloss Light Gray metal fuselage parts, Yellow upper wing, and Willow Green tail of USS RANGER aircraft. (Warren Bodie)

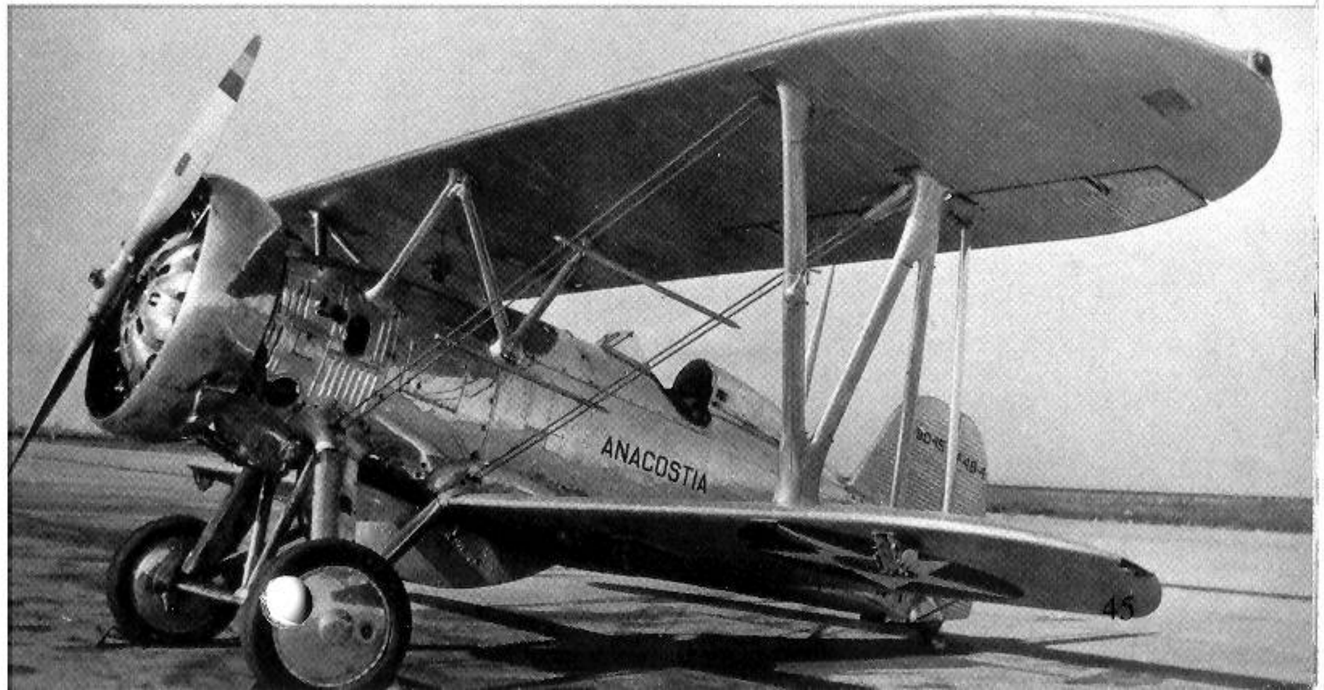
An F4B-4 from Fighting Three (VF-3) rests on one of the outrigger booms used to conserve space on the flight deck of the USS RANGER during 1935. The RANGER as commissioned in 1934 and its aircraft tail color was Willow Green. (Warren Bodle)



This F4B-4 was assigned to the Navy Proving Ground squadron assigned to NAS Dahlgren, Virginia, which was the Navy's equivalent to the Army's test base at McCook and Wright Fields. (Vincent Berinati)



The outrigger booms on carriers were used to increase the already tight parking aboard these ships. The aircraft were moved in and out on the boom by locking the tail wheel into the cradle that ran on the boom. Once in place, the aircraft were securely lashed down to prevent them from moving. This F4B-4 was assigned to VF-3B aboard the USS SARATOGA during 1932. (USN Via Bob Lawson)



(Right) Headquarters staff officers at the Navy Department had these highly polished F4B-4s at their disposal for flights to the naval air facilities within range. This F4B-4 was used by Assistant Secretary of the Navy Douglas Ingalls to attend an air show at Floyd Bennett Field during 1935. (Vincent Berinati)

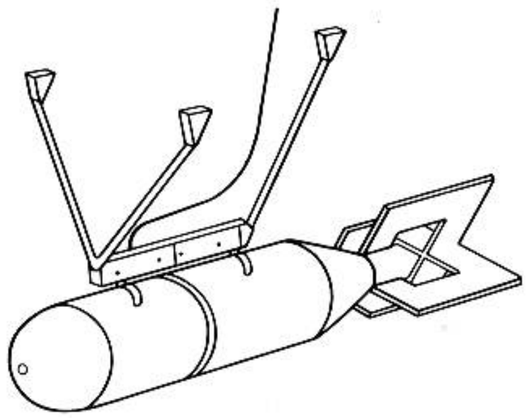
An F4B-4 from VF-9M at MCAS Quantico, Virginia. The square compartment under the upper wing housed the floatation gear that was intended to keep the aircraft afloat in the event of a water landing. The tail assembly, wheels, and cowl ring are in Red. (Jack Binder)

This F4B-3 was assigned to the Fleet Air Base squadron at Ford Island, Hawaii during April of 1934. Boeing only built twenty-one F4B-3s before shifting production over to the F4B-4. (USN via Bob Lawson)

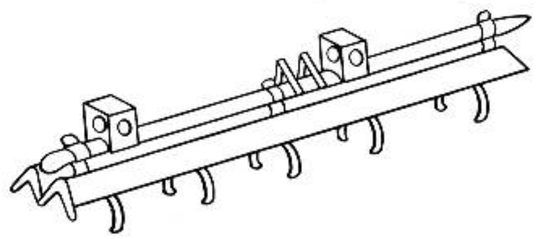
A special stunt team was made up from the Marine pilots in VF-9M, flying these F4B-4s at air shows such as the one at Floyd Bennett Field, New York during 1935. Stunt aircraft were not modified for aerial demonstrations but were, in fact, stock Marine Corps squadron fighters. This aircraft carries a practice bomb rank under the wing. (Vincent Berinati)

F4B/P-12 Racks and Ordnance

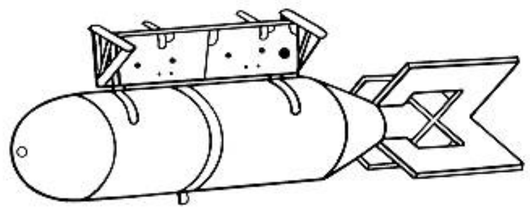
Under Fuselage Bomb Rack



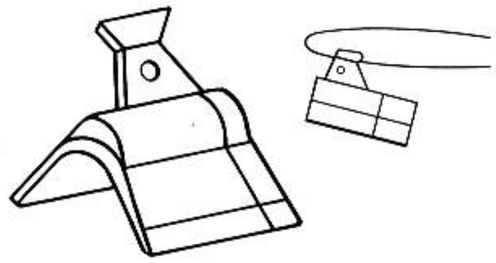
Practice Bomb Rack (25 Pound Practice Bombs



Wing Bomb Rack (Up to 500 Pounds)



Flare Shield (Mounted On Underside On Lower Wingtip)

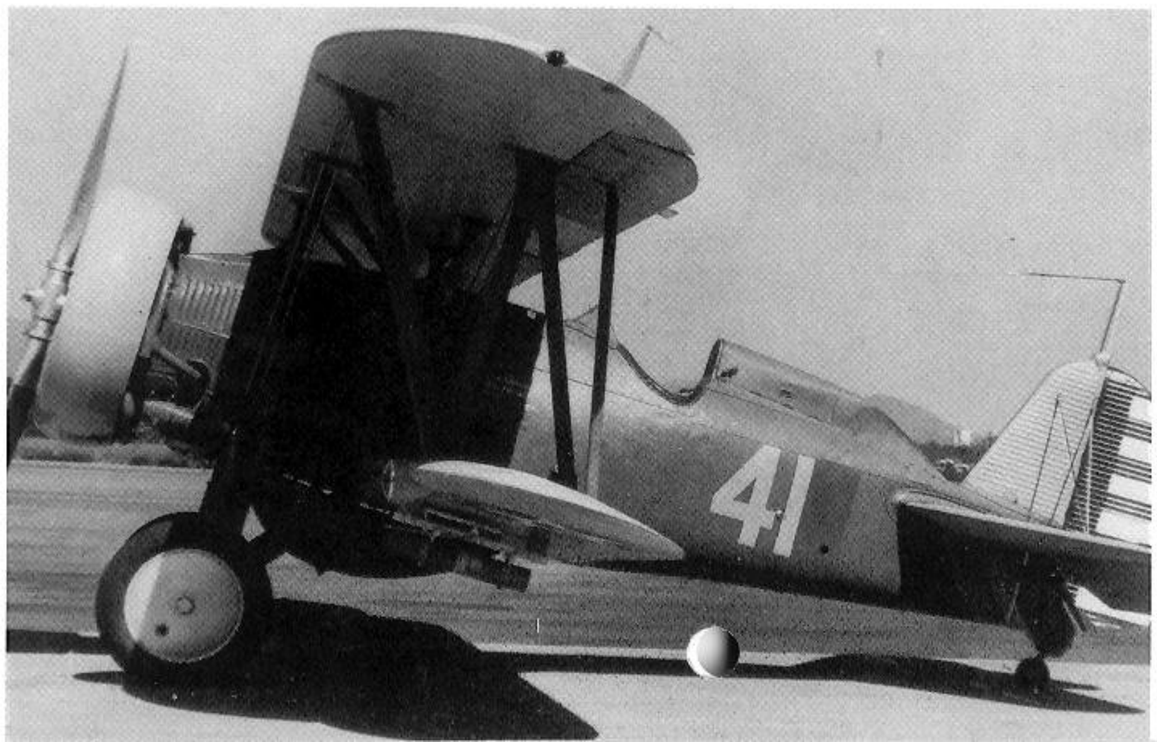


This F4B-4 from Fighting Six on USS SARATOGA was assigned to the Left Wing position of Section Six. Flight positions were denoted by cowl painting; full color cowl - Lead, top half painted - Left Wing, bottom half painted - Right Wing. (Jack Binder)

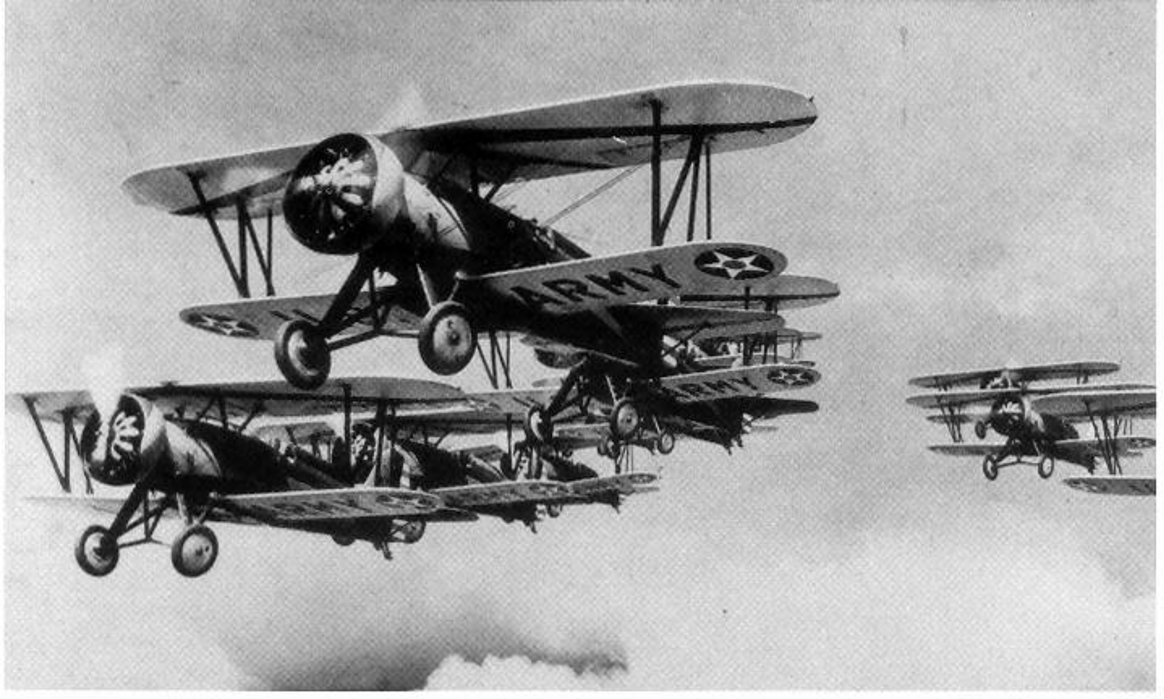
(Right) Its afterdeck full of F4B-4s of Fighting and Bombing Three (VF-3B), the flight deck crew of USS RANGER prepares for the next cycle of launches and recoveries during August of 1934. Boeing built seventy F4B-4s for the Navy. (USN via Bob Lawson)

A P-12E from the 27th Pursuit Squadron, 1st Pursuit Ggroup on the ramp at Selfridge Field, Michigan during 1935, showing the contours of the Panama Conversion Kit, which housed a life raft in the rollover bar fairing behind the pilot. The fuselage color band is Yellow. (Bob Esposito)

This P-12E (serial 32-40) was assigned to the Air Corps Training Center at Kelly Field, Texas and carries a large Yellow number on the Blue fuselage and a Yellow cowling ring (AFM)

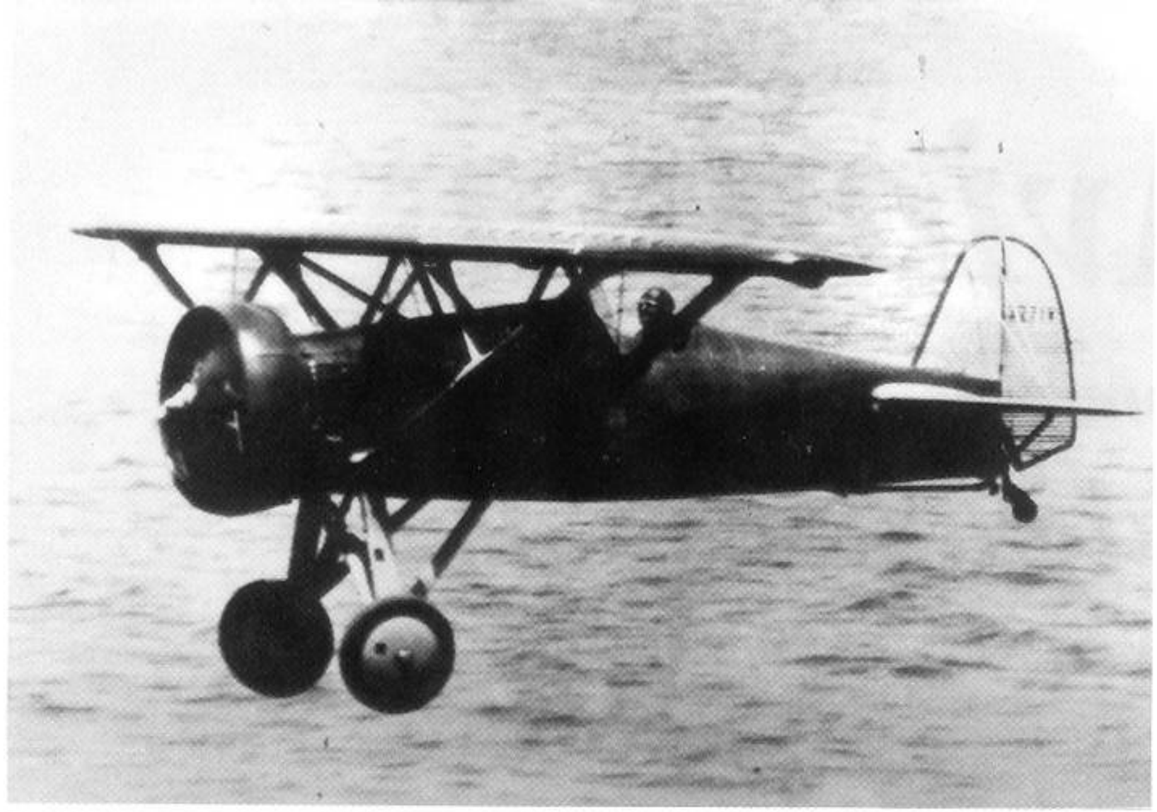


This is the restored P-12E that was 'built"at the Air Force Museum in the early 1980s. All that remained from the original P-12E was the fuselage frame, with scratchbuilt wings and new metal skin being done by Museum employees. The rebuilt P-12E was painted as a 6th PS aircraft based at Wheeler Field, Hawaii. (David Menard)



The 27th Pursuit Squadron in flight over Detroit during 1935. The bands on the underside of the upper wings indicate rank and flight position - five for squadron commander, three for Flight Lead, etc. The angle of the wheels during flight was caused by the pivoting spreader-bar axle assembly which helped absorb landing shock. (AFM)

P-12E/Fs were painted overall Silver in accordance with Army tactical aircraft painting regulations written in 1937. This P-12E is assigned to the 308th Observation Squadron in the 5th Corps Organized Reserve. The wings and tall remained Yellow. (Peter Bowers)



The XF5B-1 was a Navy duplicate of the XP-15 except for addition of carrier deck landing equipment and an F4B-3 tail. Both the XP-15 and XF5B-1 had ring cowlings and both prototypes were painted Boeing Green and Orange. (Jack Binder)

This F4B-4 was one of two ex-Marine aircraft used by the Bureau of Air Commerce (now the FAA) in 1940. When the government sold the two F4B-4s, Jesse Bristow bought both aircraft and flew them in aerial demonstrations. The modified aircraft were powered by 600 hp Pratt & Whitney Wasp engines. One crashed in 1948 and was destroyed, while the other aircraft was restored and now resides in the National Air & Space Museum. (Warren Bodle)

The XP-15 was an attempt by Boeing to use existing P-12 technology to build a monoplane. The XP-15 had an all-DURAL aluminum semi-monococque fuselage and Pratt & Whitney Wasp radial engine which gave it a top speed of 190 mph. (Jack Binder)

This Boeing Model 100A, NC 247K, was specifically designed and built for Howard Hughes. Hughes then completely redesigned and rebuilt the aircraft with a taller vertical tail, full NACA engine cowling and wheel pants. This was the only P-12 in civilian hands while the aircraft was still in military service. (Bob Esposito)

Naval Aviation

From

squadron/signal publications

LT J.E. Parker flew this Boeing PW-9C from France Field, Panama Canal Zone to Washington, D.C. during May of 1928.

The prototype Boeing Model 83 rolled out from the factory in both Boeing and U.S. Navy colors. The Model 83 served as the prototype of both the P-12 and F4B series.

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